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a quarterly journal of
PLANNING, HOUSING & PUBLIC UTILITIES

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V. Webster Johnson

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Charles F. Phillips, Jr.

Empirical Studies in the Economics of Slum Ownership

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Land Value Trends in the United States

Ernest Kurnow

Welfare Economics and the Theory of Regulation

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CONTENTS

NOVEMBER 1960

Agriculture in the Economic Development of Iran.....	V. WEBSTER JOHNSON.....	313
The Competitive Potential of Synthetic Rubber.....	CHARLES F. PHILLIPS, JR.....	322
Empirical Studies in the Economics of Slum Ownership.....	ARTHUR D. SPORN.....	333
Land Value Trends in the United States.....	ERNEST KURNOW.....	341
Welfare Economics and the Theory of Regulation.....	LUCILE SHEPPARD KEYES.....	349
Filtering and Housing Standards: A Conceptual Analysis.....	IRA S. LOWRY.....	362
Recent Industrial Development of Underdeveloped Areas in the United States	MELVIN L. GREENHUT.....	371
The Problem of the Conservation of Salmon with Special Reference to Bristol Bay, Alaska.....	JULIAN VO MINGHI.....	380

Reports and Comments

The Nature of Competition in the Motor Transport Industry.....	GEORGE W. WILSON.....	387
The Rediscount Market for Land Contracts.....	R. VERN ELEFSON.....	391
A Pure Theory of Urban Renewal: A Comment.....	MORTON J. SCHUSSHEIM.....	395

Book Reviews

Of Land and Men (<i>G. Laidlaw Eskew</i>).....	H. O. Walther.....	397
The Techniques of Urban Economic Analysis (<i>R. Pfouts, editor</i>)....	Roland Artle.....	398
Index to Volume XXXVI.....		400

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VOLUME XXXVI
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Agriculture in the Economic Development of Iran[†]

By V. WEBSTER JOHNSON*

THE PRESENT SHAH of Iran places foremost emphasis on the economic development of that country as a most important means of furthering his program of social justice and human advancement. American national interests—the goals, aspirations and values—as a helpful ally parallel those of the Shah. Not only is economic development a prerequisite for political, cultural and social advancement, it is the generating force and means for continued improvement and stability.

This paper centers around the place of rural institutions in the economic development of the agriculture of Iran. As background it deals with some relationships between agriculture and the total economy and, for illustrative purposes, with an institutional look at the economic feasibility of some rural projects. But the central thesis is that rural institutional changes are a necessary part of the take-off for substantial, progressive growth of the economy of Iran.

[†] This article, in effect, supplements the article on, "The Agrarian-Based Development of Iran," by Baldur H. Kristjanson which appeared in the February 1960 issue of this journal, pp. 1-13.

* Agricultural Economist, United States Mission to Iran.

Aims of Economic Development

Economic development in Iran requires more than capital and physical resources. In newly developing countries with rising expectations for a better life, national growth has been referred to as a "massive problem in human education and social readjustment. It is what happens in men's minds, especially in their habits and organization for working together."

Simply stated, economic development means a progressive increase in the goods and services available per person to satisfy the wants of a people. It means not only an increase in the production of goods but a wider, more equitable distribution of them. We must remember, however, that an increase in material welfare alone cannot satisfy the needs of a people. Human beings must also have hope, an opportunity, and a feeling that expectations will be realized.

As the total available capital in Iran is in short supply the government must take the leadership in directing capital into national welfare channels. The capital may come from within the country or from outside. At the present time the

masses are living near a subsistence level and consequently, restrictions on consumption will not yield sufficient resources for needed public investments although some capital within this group may be mobilized through certain institutional devices such as the credit system. For a relatively small upper class with tax-paying ability there is a fairly good source of government revenue. Nevertheless, much of the additional capital needed to launch progressive economic growth in Iran must come from the outside. And as the total capital requirements must be in large part in some form of public investment, this calls for public planning and programming.

Government planning in the use of its available resources should aim at the utilization of the total resources of the country to bring about the best utilization of the factors of production—land, labor, capital and management—in such a way as to optimize the gross national product, both present and future. The allocation of resources for economic development should be made according to a comprehensive, centralized and well-balanced plan. Balance and coordination should exist between the major sectors of the economy, within sectors, and between alternative forms of enterprise. This calls for the development of a comprehensive plan to reach certain determined objectives through a designed course of action. In the allocation of the resources of the country, national economic planning for agriculture should seek: (1) a larger farm income, (2) a wider distribution of this income, (3) greater economic security for the farmers, (4) broader economic opportunities for them—including the opportunity to get a better job in the city, (5) greater efficiency and increased productivity, and (6) conservation in resource uses. In the achievement of these objectives, agri-

cultural development is a precondition for growth in the Iranian economy.

Investments in Agriculture Versus Other Purposes

It is a fact that agriculture in Iran has not received the attention it should have from public investment. Emphasis has been on relatively large industrial projects to the neglect of agriculture. In the past, Plan Organization (the agency charged with spending the oil revenue, which is the principal source of investment funds within the country) has devoted only a small portion of its funds to the agricultural sector.¹ And significantly, Plan Organization in the past has not fully recognized that tenure changes and other rural institutional changes should accompany investments in land resources. It is the distribution side of economic development that seems to be most neglected; but, without wide distribution of the benefits of development, production can not maintain progressive growth.

The big rural development projects have thus far been for dams, multipurpose projects for power and water for urban uses. The benefits to rural people, as a whole, from irrigation have been rather minor. And the road program—a major expenditure in rural areas—although of help to the farmer in the marketing of his produce, is of much greater benefit as urban connecting links.

¹ In the Second Seven-Year-Plan Program of Iran: 1955-1962 (prepared by the Economic Bureau of Plan Organization and released March 1960) the national investment fund budgeted for agriculture, including irrigation, was a little less than 20 percent of the total investment funds for all purposes. And four-fifths of the 20 percent was ear-marked for irrigation: of that amount three-fourths was for two big dams. In the report it is stated: "In the past, Plan Organization has neglected institutional factors almost completely . . ." And ". . . most of the agricultural budget is for irrigation structures." Under the Third Seven-Year Plan (the Second is under revision at its midpoint) the agricultural budget will be directed more towards improved farm practices, new seed varieties, and basic technological improvements. These types of expenditures should yield high returns. To what extent institutional arrangements will have a part remains to be seen.

The present shortage of private capital investment in agriculture (of capital with its source largely in agriculture) in Iran arises from more profitable alternative investment opportunities. Around 41 percent of the gross national product is from agriculture but only a small part is re-invested in agriculture; and of the institutional credit in Iran, agriculture has been receiving only about 4 percent of the total.

Much of the capital of agriculture has been drained off from urban uses. Observations within villages reveal a lack of currently needed improvements. Under existing conditions including the status of landlordism² it is doubtful if large landlords will make substantial investments in village improvements. And for the present is it good business sense to do so when money can command 24 to 36 percent in the bazaar?

There is considerable evidence that, to obtain substantial investment in land and villages, it must be closely associated with the man who tills the land or is closely associated with it. In the case of the small and medium farm owner-operators, and the landlord who has a real association with his land and peasants, there is a real interest in the results of their labor. These people can use more capital effectively and its use will be a part of their life. Also the labor in land development—clearing, draining, removing rocks, etc.—is a significant type of

capital accumulation. Such matters should be taken into consideration in rural planning and programming.

It can be pointed out that between 5 and 6 thousand farm tractors have been imported into Iran and that significant areas of new land have been developed and that yields have increased through better tillage practices. But have not tractors been used largely in extensive types of farm operations and where the recovery of investment costs is anticipated in a period of 3 or 4 years? Under these conditions the amount of capital that can be invested profitably is limited. Modern technology is difficult to introduce under existing tenure arrangements and in a manner which employs farm labor productively and shares the benefits with peasant farmers.

In introducing more capital in agriculture one of the problems is the adoption of mechanized farming in the interest of the peasant. More equipment is needed suitable to family farm operations. Thus, labor will be used more productively, better tillage practices will be followed, and the timing of each operation will be more effective. The matter of timing is most important because: (1) crops often can not be planted at the most desirable time if draft animals must be relied upon; (2) harvesting and ploughing can be done much faster, permitting the growing of a second crop in many parts of the country where climatic conditions permit; and (3) an improved system of crop rotation may be followed. The effects from increased yields on existing cultivation and substantial increase in acreage under crops within existing cultivated areas would be considerable.

Some Land and Human Resource Development Problems

The physical and human resources of Iran offer a setting of advantage but with

² In the Spring of 1960 a Land Reform Law was enacted in Iran. This law is administratively weak; and it does not provide for adequate financing of the program nor for needed training activities. It most probably will distribute only relatively a few villages because of the many exemptions. There is at present a program for the distribution of public domain lands but that program has accomplished very little. By far the most successful land distribution program in Iran is that of the Shah. As of July 1960, 238 villages (comprising 143,320 hectares, or 354,144 acres, has been distributed to about 27,000 farmers. In these villages 127 farmers' cooperatives have been established. A principal weakness of the Shah's private program is the subdivision of the villages into too small ownership units and inadequate financing of the new owners.

some disadvantages for relatively rapid rural development. Iran's vast central plateau with a desert climate and limited vegetation is surrounded by a rim of high mountains. Of the 628,000 square miles (162,720,000 hectares) comprising Iran, less than one-eighth of the land is in farms and the balance in forests, grazing lands and wasteland. It is variously estimated that some 40 to 45 million hectares are cultivable at present. Iran has a population of around 20 million people, increasing at the rate of 2.5 percent a year.

Many persons believe that through feasible land and water development and the use of improved farming practices the level of agricultural output could be doubled. For the past 4 or 5 years the level of agricultural production appears to have depended more upon the weather than on technology although there has been a small increase in livestock and other farm products. However, the man-land ratio and potential land and water resources are favorable for substantial development and a large increase in agricultural production. To meet the demands at present prices arising from a rising level of income and a growing population, agricultural production should be increased at a rate of between 4 and 6 percent per year. This would permit a modest rise in levels of living as incomes rise from the present level of less than \$100 per year per capita.

Some obstacles in the path of the agricultural production requirements are these: (1) *transportation*, a basic problem because of the central desert area; (2) *agricultural educational programs* which have not progressed very far at the village level; and (3) *the predominance of land-holdings* generally comprised of villages and the accompanying feudal controls exercised over the production and marketing processes.

And the problem of planning in itself, exclusive of administrative difficulties, is more difficult in newly developing countries such as Iran than in developed countries. In the latter the market mechanism—well established channels of demand and sources of supply—will bring forth most of the goods needed and the changes in food and fiber output to meet changes in tastes. Much that needs to be done occurs automatically through the market place, subject of course to certain restraints.

In underdeveloped countries the situation is very difficult. There is: (1) lack of a well established market; (2) the impact of one type of production on another is not known (i.e., little is known of cross elasticities); (3) oligopolistic market structures limit competition for farm products; (4) wide ranges in rate of returns on different types of investments cause capital to enter channels where speculative considerations drive returns up but which contribute little to increased production.

One of the strategic needs in program investments is that the goods accrue soon so as to avoid serious inflation. Some inflation is unavoidable—it is also an incentive to production and desirable shifts of resources—but rapid inflation can not only defeat desired economic objectives but contribute to social unrest with serious consequences. More is involved in planning large agricultural projects requiring hundreds of millions of dollars and maturing 10 to 15 years hence than mere cost-benefit analysis. The inflationary impact of such projects must also be considered. A balance must be achieved between pressing current needs and the necessity to invest for future growth. As a whole, agriculture offers many favorable opportunities for rapid growth in highly desired consumer goods. In the setting of many underde-

veloped countries—including Iran—such immediate returns justify substantial emphasis on productivity increases on a broad front, often even at the cost of spectacular, but slow-maturing and sometimes inordinately expensive irrigation and land settlement schemes.

Capital Investments in Agriculture

It is a fact that, if the level of agricultural production in Iran is to be increased substantially, large amounts of capital investment in agriculture are necessary. An expanding agriculture in Iran depends upon: (1) An improved and enlarged system of irrigation; (2) large expenditures for land improvement and development; (3) better agricultural practices and methods; (4) village improvement programs; (5) growing productivity of farm labor; (6) massive training programs; (7) research to give answers to good farming practices—and not too late; (8) institutional adjustments and changes. These call for very large expenditures although not beyond the capacity of the Nation. The last three items are closely related and involve the use of funds and facilities for investment in the abilities of man.

The economic development of Iran depends not only upon the physical resources available for production and how effectively they are used but also upon the institutional framework in which economic activities are carried on. The principal physical resources are land and water, and the potentials of use in the future. Here substantial possibilities are known to exist. How effectively resources are used depends on the know-how, knowledge, and the ability to implement improved farming practices. And the dissemination of information, the acquiring of new information, and an enlarged service to the farmers of

Iran rest in the means or institutions available.

No economic system is static. The system undergoes change and the changes that occur often are manifest through institutional adjustments. Institutions may take the form of habits or customs, or legally established rights and organizations in the production, distribution and consumption of goods. They are man-made organizations or ways of doing things by group action. For example, the recognized tenure rights and ownership pattern, agricultural and cooperative credit system, community organization, marketing facilities are institutions; and land reform, land taxation and sharing of farm returns have many institutional aspects.

Obviously, in any agricultural development program in Iran a good knowledge of the physical base and its potentials is necessary. We shall try to show how and why the physical, economic, and institutional factors tie together in a development program. For program planning, let us first list some of the physical and quantitative considerations. Some of the principal ones are:

1. Land Resource Inventory.

(a) Use capability of land resources by major land classes.

(b) Present and potential availability of water by sources, uses, areas. Insofar as possible, quantitative measures should be obtained on present uses and the future potentials of the land and water resources.

2. Changes in Land Uses and New Practices.

(a) Shifts in crops, i.e., increase in forage for expanded livestock enterprises.

(b) Introduction of new seeds, fertilizers etc., and facilities to increase efficiency and quantity of supply.

(c) Types and kinds of farm machinery required under projected patterns of land uses and labor resources.

3. Quantitative Measurement.

(a) The quantitative results of increase in oil crops, more livestock, land improvements etc., should be presented in a form meaningful for appraisal.

(b) When quantitative measurement is not possible or very limited, then as clear a qualitative picture as possible of anticipated results should be presented.

On the basis of an appraisal of the land-water resources of Iran the economic feasibility of types of expansion and development may be explored under certain assumptions. The purposes of an evaluation of costs and returns by projects or segments of a project are:

(1) To determine if a certain type of public and private expenditure will be economic. For example, pump irrigation of x hectares in area y .

(2) To appraise the desirable type, size and scale of sound economic investment as in a program of introducing improved livestock breeds.

(3) To estimate the relative desirability of expenditures between types of projects as funds are limited and choices must be made. Funds may be spread so thin that the results are dissipated or they may be sunk in a few large projects of doubtful returns.

(4) To determine how public and private interests should in certain cases share the costs: a sharing of costs, and protection against risks will be necessary to bring about certain shifts in production. Education in good farming practices in itself is not always effective in an illiterate village with a traditional archaic social organization. Incentives have a place to induce villagers to make changes and to protect them from possible losses, as for instance in the returns from crop and livestock in the adoption of new practices.

(5) For certain types of projects, as in irrigation, to determine the basis of public charges to private beneficiaries.

Good administration is necessary in the execution of these tasks. The lack of adequate working statistics is a serious handicap to economic analysis in Iran. And information that is available in

Iran does not readily move up to a single central planning agency. Strengthening of the planning functions of the staff agencies—the Ministry of Agriculture, Agricultural Bank of Iran, etc.—with both scientists and administrators is necessary; also the research to understand what should be done and how to do it is a part of the function of substantive agencies.

It is also recognized that in a country such as Iran, with many unknowns, it is not possible to rest one's case on quantitative economic analysis. Limited data of questionable accuracy, lack of experience of the results of undertakings that need to be known for sound economic planning and a great void in research findings under tested conditions, also call for qualitative analysis. It is necessary to step beyond the bounds of economics and function as social scientists in the broader field of political economy and institutional economics. But social and economic appraisals—the best that can be made—should go far in weeding out costly and inefficient projects or undertakings and segments thereof, both for society and individuals.

Some of the agricultural development needs, however, are so clear as to require little investigation. The task is how to get started. For example, it is well recognized that much can be accomplished through range improvement and more forage production on farms. An expanding agricultural economy in Iran is heavily dependent on livestock. The volume of the demand for meat and dairy products is evidenced by the increasing rate of growth in slaughter and the use of imported butter. There are two principal problems:

(1) *Range Improvement.* Livestock losses run into millions of animals annually, and serious over-grazing has made

malnutrition chronic. More than 15 percent of the sheep are lost each winter when feed supplies become scarce. Range lands are virtually unprotected and rarely tied in with cultivated land in a single livestock production enterprise. A modern grazing and range development program is badly needed. Indicative of current thinking is the program of land distribution in the Shah's villages. Although arable land is sold to cultivators, control of adjoining pasture lands has been retained by Amlak, the land distribution agency. Grazing rights are awarded through competitive bid on an annual basis, sometimes to villagers but frequently to outsiders. Under these circumstances the individual livestock grower has every incentive to strip the range bare during his year of occupancy, and the integration of sheep and cattle into village farm enterprises is effectively impeded. The result is an obvious failure to adopt good farming practices, and a serious loss of efficiency of farm labor.

(2) *Farm Forage Crops.* The present farm forage crop situation is very discouraging. Without great improvement, the development of the animal resources of Iran, which should have high priority in any agricultural plan, is not possible. Better fed animals, improved livestock breeds, and control of diseases are urgent social needs; and all must be a part of a good program. One possible way to make progress on this important and complex problem is to establish a number of modern livestock farms for the purpose of acquiring more know-how on forage-livestock production operations, and for demonstration and educational purposes. The demonstration farms could be solely under government operation or under some type of contract arrangement between government and individuals. Another alternative is through well planned

livestock and forage programs in selected areas, adequately serviced by technicians and supported by a good credit program.

It is felt that the studies, research, pilot operations etc., necessary for good economical appraisals of projects should be given much more attention. And as aid programs move more in the direction of loans, as seems to be the trend, then it becomes increasingly important to select projects with good repayment ability which will stimulate latent talents and interests of people: a need for current and continuous economic evaluations. First we need to know the facts of a project, as obtainable, and in a social, economic and institutional setting before implementation.

Why Institutional Changes

In underdeveloped countries the task of economic implementation is much different than it was in rehabilitating the war-torn countries of Western Europe following World War II. In Western Europe the existing institutions were satisfactory but undergoing steady evolutionary change. But in the newly developed countries rural institutions have often virtually stagnated, even though institutional and often drastic changes are basic to increased production and self development and are an essential part of the growth of the democratic process. In the newly developing countries it is to the interest of free people that development take place within the orbit of the democratic world and not under the temptations of communism. To stand for and support institutional changes in the interest of the masses is an inescapable responsibility of those who would promote democratic economic development.

For illustrative purposes we shall briefly consider only three institutional changes, other than those expressed or

implied previously, which have a place in the agricultural development of Iran.

(1) Land reform appears to be one of the essential ingredients for economic development in Iran. Why? There are a number of reasons: (a) Expanded agricultural production and growing productivity in agriculture are almost by definition essential for the economic development of the nation as a whole. Present land tenure practices do not permit the necessary changes in production techniques nor do they link investment and effort on the part of the cultivator to the return he realizes from his holding. (b) The growth of industries based on agricultural raw materials can not continue without reliable and growing sources of supply. (c) Unless the purchasing power of the 70 to 80 percent of the population of Iran dependent upon agriculture is raised through increased productivity and better distribution of income, then the market for goods produced in Iran must remain pitifully constricted. Poverty in agriculture is a principal reason for the limited market for volume production. (d) Basic economic and social legislation will continue to be blocked and the need for better collection of land taxes thwarted without a change in the tenure system. (e) Large public expenditures or investments in agriculture imply that the benefits from them be widely distributed. No government in an underdeveloped nation can long justify subsidizing the already privileged few.

However, land reform should be on a firm and progressive basis. Adequate farm units should be allotted to the new landowners; all their credit needs should come from one source and under a program of supervised credit; an adequate staff must be provided to help farmers adopt improved farming practices; and a land reform agency must be established

with strong administration, well financed and with the necessary funds for a dynamic training program. Otherwise, the results will be bad and agricultural production may fall. This can happen because the new peasant owners lack management experience and they must have a source of supervised credit. Landlords now provide these services and land distribution in itself will create a big void in what it takes to increase production. The job calls for careful planning and large public expenditures but the costs will be greater if the needs are not met. Not to deal with problems does not avoid problems and costs.

(2) A good agricultural credit and cooperative system is also necessary to economic development in Iran. It offers a practical means to introduce more capital into agriculture. Credit on reasonable terms is essential to provide the resources needed for increased agricultural production and improved rural living. Excessive charges by the money-lenders reduces the farmer's incentive for savings and thrift, and restricts funds for new production investments.

Cooperatives provide a means of servicing economically the credit needs and other services of small farmers. They are a means of mobilizing existing capital in villages and there is today in Iran considerable unused or poorly used capital. Cooperatives can also become an educational device in decision-making and for improved social organization and group action. The Agricultural Bank of Iran has underway a substantial cooperative credit program.³

³ Remarkable progress has been made by the Agricultural Bank of Iran in the organization and servicing of credit cooperatives. There are at present 639 rural cooperatives with a membership of nearly 290,000 and loans outstanding to members amount to over 400 million rials (\$5,260,000). The share capital owned by farmers is around 140 million

(Continued on page 321)

There are many small and medium-sized farmers in Iran who own their land or have permanent use rights to it. A program providing for the complete financing of the credit needs of these farmers under a supervised agricultural credit program—credit plus introduction of new methods plus education—could have a substantial impact on the economy. The results of an impact program designed to reach small owner-operators would be more immediate than a program for new-owner-cultivators of distributed lands and the program would provide a valuable experience in the use of credit for the overall Land Reform Program of Iran.

Well financed, adequate-sized family farms can be highly successful economic and social units—more so than large industrial farms. This is because agriculture is not subject to the same type of increasing returns as is found in industry. The growing season is for certain periods of time. A series of productive processes cannot be brought together at a given time to assemble a commodity. Efficiency in farming lies in the full use of labor by modern methods over a period of time.

(3) Expanded extension and community educational programs in the villages should go hand in hand with an enlarged credit program. Greatly expanded secondary and college educational programs are also of primary im-

portance to agricultural development since in land and water resource development it is not capital but trained people that are the limiting factor. Capital can be effectively used only insofar as brain power exists and it is man who must establish the institutions necessary to do a good job of planning for economic development and for executing good development programs. If this exists, there will be progress and security and the necessary foreign capital will be attracted to a country. If not, private capital will be unventuresome and considerable indigenous capital will move out of a country. Also, in many situations new organizations, the will to move forward, and labor can in part be substituted for capital in the process of development.

A pressing need for investment in agriculture is in education, training and demonstration: to obtain and disseminate information on the kinds of fertilizers best suited for different uses, to introduce new seeds, for improved technology, to establish demonstration farms, to organize and service farmers cooperatives, and to formulate and execute sound land and farm programs. It is the ability to do this type of thing that gauges the rate at which capital can effectively be absorbed in agriculture. And some continuing progress is an important factor.

The people of the newly developing countries are in the midst of a world revolution which has been called "the revolution of rising expectations," meaning essentially a desire for change in existing institutions, new institutions, and in ways which give expression to the desires and aspirations of people. We must never lose sight of the human side of development and that the end use of all goods is man.

(Continued from page 320)

rials (\$1,840,000) and it has increased very substantially since the cooperatives were first organized. Repayment of loans when due are averaging 92 percent. Most of this achievement has occurred during the last 18 months (since January 1959). But what has been accomplished meets only partially the present and growing credit needs of the farmers. More loan funds and support for training activities and servicing functions to the small farmers of Iran should have a very high priority in Iran's development program.

The Competitive Potential of Synthetic Rubber†

By CHARLES F. PHILLIPS, JR.*

Introduction

HISTORICALLY, Southeastern Asia has been the major source of the world's supply of natural rubber. Now more than 90 percent of the natural rubber supply comes from this area. Moreover, natural rubber has been, and continues to be, the leading product and export commodity of these underdeveloped countries.

The development of a full-scale domestic synthetic rubber industry, combined with a rapid increase in foreign capacity, raises a complex and somewhat speculative question as to the future of natural rubber. During 1959 domestic consumption of synthetic rubber reached 64.5 percent of the new rubber market. While foreign demand has been considerably lower, it is estimated that European synthetic rubber consumption was approximately 25 percent. There can be little doubt that synthetic rubber presents a strong challenge to the natural rubber producing industry.

It is the thesis of this paper that synthetic rubber has already proven its competitive potential and that natural rubber must meet this threat or face a gradually declining world market. This situation is largely the result of recent technological innovations in man-made rubber, giving higher quality rubber at stable prices. We will discuss domestic and foreign synthetic rubber capacity and recent technological advances. We will then outline the steps currently

being taken by natural rubber producers to meet the competitive challenge of synthetics and present briefly some implications for United States national security and foreign policy.

Synthetic Rubber Capacity

The Domestic Industry. During World War II the United States government, faced with a dwindling stock of natural rubber and cut off from further supplies, financed the building of a synthetic rubber industry. Fifty-one plants were built, representing a capital outlay of nearly \$700 million. The plants were operated on a cost plus management fee basis by chemical, oil, and rubber companies. From a meager production of 8,000 long tons in 1941, the industry turned out over 495,000 long tons in 1944. Acquired by private companies in April 1955 and since expanded, the synthetic rubber industry today has an annual capacity of approximately 1.7 million long tons.

Table I lists the producers of the four basic commercial categories of synthetic rubbers, along with rated capacity.¹ As is indicated, the structure of the domestic industry is one of oligopoly. Of the thirteen SBR producers the top four control 61.6 percent of total capacity. Looked at another way, the "Big Four" rubber fabricating producers control 54.6 percent of SBR production capacity. Of the three major remaining categories of synthetic rubbers, both CR and IIR are produced by only one company each,

† This paper is a revision of a chapter from the author's Ph.D. dissertation, "Competition in the Synthetic Rubber Industry," which was deposited in the library of Harvard University in 1959. The author is indebted to Professors Carl Kaysen and George R. Hall for their comments and criticisms.

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¹ SBR, a general purpose synthetic rubber, is the most important, accounting for 83 percent of 1959 domestic synthetic rubber consumption. The other three rubbers, known as special purpose rubbers (CR, IIR, and NBR), in order of percentages consumed: CR, 7.8; IIR, 6.1; and NBR, 3.1.

COMPETITIVE POTENTIAL OF SYNTHETIC RUBBER

323

TABLE I—THE DOMESTIC SYNTHETIC RUBBER INDUSTRY AND PRODUCTION CAPACITY: 1955 AND 1959

Company	Plant Location	Production Capacity (thousand long tons)	
		(May 1, 1955)	(December 31, 1959)
American Synthetic Rubber Corp. ¹	SBR PLANTS		
Copolymer Rubber and Chemical Corp. ²	Louisville, Kentucky*	44.0	68.5
Dewey Almy Chemical Division, W. R. Grace & Co....	Baton Rouge, Louisiana*	49.0	95.0
Firestone Tire & Rubber Co.....	Cambridge, Massachusetts	3.0
	Akron, Ohio*		
General Tire & Rubber Co. ³	Lake Charles, Louisiana*	129.6	231.5
Goodrich-Gulf Chemicals, Inc. ⁴	Odessa, Texas	40.0
	Port Neches, Texas*		
	Institute, W. Virginia*	95.0	274.0
Goodyear Tire & Rubber Co. ⁵	Houston, Texas*		
	Akron, Ohio*	146.5	255.6
International Latex Corp.....	Dover, Delaware	13.6
Phillips Chemical Co. ⁶	Borger, Texas*	69.4	118.0
Shell Chemical Corp. ⁷	Los Angeles, California*	94.0	126.0
Texas-U. S. Chemical Co. ⁸	Port Neches, Texas*	88.0	127.0
United Rubber & Chemical Co. ⁹	Baytown, Texas*	62.0	69.8
United States Rubber Co.....	Naugatuck, Connecticut*	22.2	32.0
		799.7	1,454.0
Esso Standard Oil Co. ¹⁰	IIR PLANTS		
Humble Oil & Refining Co. ¹⁰	Baton Rouge, Louisiana*	n.a.	50.0
	Baytown, Texas*	n.a.	55.0
		90.0	105.0
E. I. du Pont de Nemours & Co.....	CR PLANTS		
	Montague, Michigan		
	Louisville, Kentucky	102.0	125.0
Firestone Tire & Rubber Co.....	NBR PLANTS		
The B. F. Goodrich Co.....	Akron, Ohio	n.a.	n.a.
Goodyear Tire & Rubber Co.....	Cleveland, Ohio.	n.a.	n.a.
International Latex Corp.....	Akron, Ohio	n.a.	n.a.
United States Rubber Co.....	Dover, Delaware	n.a.	n.a.
	Baton Rouge, Louisiana	n.a.	n.a.
		55.0	60.0

* Government-owned plant sold under the Disposal Act of 1953, as amended.

¹ Constituent stockholding companies of A.S.R.C.: American Biltrite Rubber Company, American Cynamid Company, Anaconda Wire & Cable Company, Bata Shoe Company, Inc., Bristol Manufacturing Company, Brown Rubber Company, Inc., Converse Rubber Company, Dewey & Almy Chemical Division, W. R. Grace & Company, Dunlop Tire & Rubber Company, Endicott Johnson Corporation, Faultless Rubber Company, General Cable Company, Goodall Rubber Company, Goodyear Footwear Corporation, Goodyear Rubber Company, Hewitt-Robins Inc., Johnson Rubber Company, LaCrosse Rubber Mills Company, Phelps Dodge Copper Products Corporation, Raybestos-Manhattan Inc., Rome Cable Corporation, Seamless Rubber Company, Inc., Servus Rubber Company, Simplex Wire & Cable Company, Sponge Rubber Products Company, Thermoid Company, Tingley Reliance Rubber Company, Tyer Rubber Company, Wooster Rubber Company.

² Constituent stockholding companies of Copolymer: The Armstrong Rubber Company, Armstrong Rubber Manufacturing Company, The Dayton Rubber Company, The Gates Rubber Company, The Mansfield Tire & Rubber Company, Sears, Roebuck & Company, Seiberling Rubber Company.

³ Formerly General Rubber Synthetics Company, a wholly-owned subsidiary, merged with the parent company in 1957.

⁴ 50 percent owned by The B. F. Goodrich Company and 50 percent by Gulf Oil Company.

⁵ Formerly Goodyear Synthetic Rubber Corporation, a wholly-owned subsidiary, merged with the parent company in 1957.

⁶ A wholly-owned subsidiary of Phillips Petroleum Company.

⁷ A wholly-owned subsidiary of Shell Oil Company.

⁸ 50 percent owned by United States Rubber Company and 50 percent by Texaco, Inc.

⁹ A wholly-owned subsidiary of United Carbon Company.

¹⁰ Esso is a wholly-owned subsidiary, and Humble a 98 percent controlled affiliate, of Standard Oil Company (New Jersey).

Sources: SBR data from *Third Report of the Attorney General on Competition in the Synthetic Rubber Industry* (Washington, D. C.: United States Government Printing Office, 1959), pp. 2-3, 14; IIR, CR, and NBR capacity figures supplied by the companies.

while NBR is produced by five companies.

This structure provides a characteristic of the domestic industry which is of major importance: vertical integration. In 1958 "captive" sales, comprising outright intracompany transfers and sales to affiliated or constituent companies, amounted to 56.7 percent of domestic SBR sales. Consequently, the organization of the domestic industry is one where the major consumers of synthetic rubber own the producing plants, bear the costs of operating these plants, and are in a position to avail themselves of the economies of declining marginal costs.² And as these producers are interested in marginal, not average, costs such integration definitely favors synthetic rubber vis-à-vis natural rubber.

Foreign Capacity. The large-scale commercial development of synthetic rubber was primarily an American enterprise. As such, important patents and processing know-how was vested solely with domestic producers. In part this helps to explain the slow adoption of synthetic rubbers outside of the United States. But other reasons are equally significant. The failure of the government to export synthetic rubber in substantial volume, especially SBR types, in the postwar years undoubtedly retarded its use abroad. Since the production and export of natural rubber has historically been a leading source of dollar income to the sterling area, European resistance to synthetic rubber was very strong. Serious foreign dollar shortages in the postwar period restricted purchases from domestic producers. Moreover many governments overseas placed restrictive barriers in the way of synthetic rubber imports. During 1955-57, for example, Great

Britain imposed a ceiling of 60,000 to 80,000 long tons annually on such imports. Finally, political considerations made synthetic rubber imports in many countries extremely difficult. Again using Great Britain for illustration, her import restrictions have always been considered too high by Far Eastern natural rubber producers and Malayan growers and these parties have argued that the established synthetic rubber ceiling would have to be lowered if the country's economy was not to be endangered.

But this reluctance has been overcome in the past three or four years. Some indication comes from the fact that European consumption of synthetics has increased from an estimated 8 percent of total new rubber consumption in 1955 to nearly 25 percent in 1959. A further indication is the volume of domestic exports. For the past three years domestic exports have been 203,468 (1957), 193,917 (1958) and 289,843 (1959). It must also be pointed out that the 1957 level was reached despite a year-long downward trend in the price of crude rubber. Of these exports nearly 40 percent were sales to subsidiaries or affiliated companies.

Foreign free world production in 1959 was nearly 290,000 long tons. (It is estimated that iron curtain countries have productive capacity for 566,000 long tons annually, although some place capacity as high as 700,000 tons.) By late 1961, when all plants now under construction are completed (Table II), free world foreign capacity should reach 717,000 long tons. Counting domestic producers, total free world capacity is expected to reach 2.6 million long tons by late 1961 or early 1962.

As Table II shows, many leading American producers are engaged in the construction of these foreign plants. Others have made investments in Euro-

² See "Synthetic Rubber Recommendations of the President," January 1950, pp. 43-48; and "Synthetic Rubber," *Chemical & Engineering News*, July 24, 1950, pp. 2504-09.

COMPETITIVE POTENTIAL OF SYNTHETIC RUBBER

325

TABLE II—SYNTHETIC RUBBER PLANTS IN OPERATION OR UNDER CONSTRUCTION OUTSIDE OF THE UNITED STATES:
AS OF JANUARY 1, 1960*

Country	Type of Rubber	Capacity (long tons)	Ownership
I. FREE WORLD			
<i>Australia</i>	SBR	30,000	Australian Syn. Rubber Co.
<i>Brazil</i> Duque de Caxias.....	SBR	40,000	Firestone, Goodyear
<i>Canada</i> Sarnia.....	SBR; and special purpose rubbers	135,000	Government
<i>France</i> Port Jerome.....	Butyl	20,000	Societe du Caoutchouc ¹
Strasbourg.....	SBR	40,000	Societe d'Etudes
Strasbourg.....	Special purpose rubbers	6,000	Pechelbronn
		66,000	
<i>Germany</i> Leverkusen.....	Chloroprene	2,500	Farben-Fabriken
Leverkusen.....	Neoprene	20,000	Farben-Fabriken
Leverkusen.....	Chloroprene	3,600	Knapsack Gresheim
Leverkusen.....	Acrylonitrile	7,200	Knapsack Gresheim
Marl.....	SBR	70,000	Buna Werke Huels ²
Marl.....	SBR	11,000	Chemische Werke
Marl.....	Polyisobutylene	5,000	B.S.A.F.
		119,300	
<i>Holland</i> Arnhem.....	Special purpose rubbers	15,000	AKU, Goodrich
Pernis.....	SBR	55,000	Royal Dutch Shell
		70,000	
<i>India</i> Bareilly.....	SBR	30,000	Kilachand Devchand, Firestone
<i>Italy</i> Ravenna.....	SBR	60,000	ANIC ³
<i>Japan</i> Kawasaki.....	Hycar	8,400	Japan Geon. Co.
Yokraichi.....	SBR	30,000	Japan Syn. Rubber Co.
		38,400	
<i>Spain</i> Miranda de Ebre.....	SBR	8,000	Government
<i>United Kingdom</i> Barry.....	Acrylonitrile	10,000	British Geon.
Birmingham.....	SBR and Special purpose rubbers	2,000	Dunlop

* Table compiled from information, courtesy of M. E. Lerner and *Rubber Age*.¹ Owned by Kleber-Colombes, Dunlop, Michelin, Cia. Francaise de Raffinage, Esso-Standard, Pechiney, Manufactures de Produits Chimiques du Nord, Kuhlmann, Rhone-Poulenc, Bozel-Maletra, and Ugine.² Owned 50% by Chemische Werke Huels; 16.7% each by Badische Anilin und Sodafabrik, Farbenfabriken Bayer A. G., and Farbwerke Hoechst.³ ANIC is a subsidiary of State-owned Ente Nazionale Idrocarburi.

TABLE II—(Continued)

Country	Type of Rubber	Capacity	Ownership
Hythe.....	SBR	70,000	I.S.R.C. ⁴
Londonderry.....	Neoprene	20,000	du Pont
Newport.....	SBR and special purpose rubbers	4,000	Monsanto
Wilton.....	SBR	10,000	Imperial Chemical Industries Ltd.
	Nitrile	5,000	
		121,000	
TOTAL FREE WORLD.....		717,000	
II. IRON CURTAIN COUNTRIES			
East Germany			
Schkopau.....	SBR	80,000	Government
Poland			
Dwory.....	SBR	36,000	Government
Romania			
N. Bucharest.....	SBR	25,000	Government
Russia			
eleven plants.....	SBR	400,000	Government
	Chloroprene	25,000	
		425,000	
TOTAL IRON CURTAIN COUNTRIES.....		566,000	
GRAND TOTAL.....		1,283,000	

⁴ Jointly owned by Dunlop Rubber, Goodyear Tyre & Rubber, Firestone Tyre & Rubber, and Michelin Tyre Co

pean concerns, hedging a possible loss of export markets.

Technological Innovation in Synthetics

The domestic synthetic rubber industry, as well as a large percentage of free world foreign capacity, is operated by financially strong oil refining and rubber manufacturing companies. Historically these two industries have been noted for their high rate of technological innovation. Innovation in the synthetic rubber industry has been no exception.

Recent technological developments have been of three kinds: new rubber types, engineering advances in production techniques, and quality improvements. A few leading examples of each will be described in this section.

New Rubber Types. Polymer research has resulted in a continuous flow of new synthetic rubber types. Perhaps the outstanding example is afforded by the development of synthetic natural rubbers.

Early in 1955 two new types of synthetic rubber were announced: polyisoprene, a synthesis of materials with the same unit structure as the natural rubber hydrocarbon and polybutadiene, a synthetic compound that is close to the natural product.³ Extensive tests show that each is a substitute for natural rubber in many uses where the latter is now required, such as large truck tires.

³ A third rubber, ethylene-propylene, has moved from the laboratory to the semi-commercial stage at Montecatini's Ferrara plant. The synthetic is being developed for use in automobile tires.

Several domestic producers are currently engaged in pilot plant tests and in the construction of full-scale production capacity. Within a year the domestic industry is scheduled to have a productive capacity for at least 155,000 tons of these two synthetics.⁴ While it is still too early to determine whether either of these synthetic natural rubbers will prove commercially successful, pilot plant tests have been highly encouraging. The ultimate success of both rubbers will depend upon the price behavior of natural rubber in the next few years.⁵ At the same time, from a national security viewpoint the United States now appears to be completely self-sufficient in rubber.

While the development of synthetic natural rubbers represents the most spectacular research accomplishment, other special purpose rubbers have also been put upon the market. These include urethane and fluorelastomer rubbers. When blended with crude rubber these synthetics can be used in a wide range of products.

Engineering Advances. The outstanding example of recent advances in production techniques is General Tire's 40,000 ton continuous SBR plant opened late in 1957.⁶ The plant is the first such operation designed and built from the ground up as an integrated setup for continuous polymerization. One important feature

is the use of instrumentation to a degree unknown in previous synthetic rubber plants. This and other engineering advances makes it possible for General to produce at a ton-per-man rate equal to that of a plant four or five times as large.

Closely related to engineering improvements has been advances in synthetic rubber packaging. SBR rubbers are shipped almost exclusively in baled form. Of necessity the bales are coated or covered to reduce adhesion to the cover bag. For many years soapstone dusting was used but was not satisfactory. With the development of polyethylene films, however, bale wrappers were designed using this film and improvements resulted. Thus the polyethylene film can be consumed in the compounds without altering the physical properties of the polymer.

Other process developments might be mentioned, such as a commercial process for continuous polymerization of high-solids latex and improved methods of drying synthetic rubbers, but the examples already outlined will indicate that substantial energies have been expended at the production level to develop cost reducing methods.

Quality Improvements. The third general area of technological innovation is quality improvement. During the past five years, the range of synthetic rubber has greatly increased and over twenty new categories have been put on the market. In a recent survey of rubber fabricators, it was overwhelmingly agreed that synthetic rubbers have continued to improve in quality.⁷

Quality improvements have had four effects upon synthetic rubber consumption. First, an increasing blend ratio of synthetic to natural or other synthetics is

⁴ Plants currently under construction or planned, with estimated capacity, type of rubber, and completion date: Shell, 20,000 tons, polyisoprene, December 1960; Phillips, 25,000 tons, polybutadiene, December 1960; Firestone, 30,000 tons, polybutadiene, March 1961; American Rubber, 30,000 tons, polybutadiene, September 1961; and Goodyear, 25,000 tons, polybutadiene, December 1961. In addition, Goodrich-Gulf has plans for a 25,000 ton polybutadiene plant but no construction date has been set. All of these plants can be converted easily from the production of one synthetic type to the other.

⁵ Shell is currently (1960) selling its limited output of polyisoprene at 30 cents per pound, fob Torrance, California. This price is competitive with the better grades of natural rubber. Present indications are that price will remain close to 30 cents once full-scale commercial production is underway.

⁶ See *Chemical Engineering*, June 2, 1958, pp. 102-05.

⁷ *Third Report of the Attorney General on Competition in the Synthetic Rubber Industry* (Washington, D. C.: United States Government Printing Office, 1958), p. 42.

now possible. To illustrate: one category of SBR is known as cold rubber. Where formerly manufacturers of large-size tires would use a maximum of only 13 percent SBR in their product, the improved quality of cold rubber now makes it possible to use a 50:50 blending ratio.

Second, quality improvements have opened new markets for synthetic rubbers. Early in their development, man-made rubbers had certain characteristics which made their use impossible in many areas. Today, with lighter color, odorless, and non-discoloration, synthetic rubbers can be used when an attractive appearance is of equal importance to durable performance, in such uses as heels, soles, toys, floor tile, and sporting goods. This has brought synthetics into closer competition with plastics and other similar materials.

Third, competition between synthetic rubbers has increased. The outstanding example is Esso's new all Butyl (IIR) auto tire. After spending \$13 million in research and development, and another \$6 million for laboratory and road testing, the new tire came on the market late in 1958. At stake for the Company is the 512,000 ton SBR market for tires and tire products. Thus, not only are SBR producers faced with potential competition from synthetic natural rubbers, but also from Butyl.

Fourth, in the light of price stability, quality improvements are of direct importance to rubber buyers. Evidence suggests that the synthetic rubber buyer is now receiving a higher quality product for the same price, as opposed to either the same quality at a constant price or an improved quality at a higher price.

Progressiveness in synthetic rubber has been rapid. New types of rubbers have been developed, the quality of older types greatly improved, and new markets obtained. All of these factors have in-

creased the competitive potential of man-made rubbers. Natural rubber producers have been issued a strong challenge.

The Natural Rubber Industry

Natural rubber producers are confronted by a financially strong and technologically progressive synthetic rubber industry. The competitive position of crude rubber may ultimately be decided by three factors: quality, costs and price.

Quality. One problem which has confronted rubber manufacturers for many years is the quality of natural rubber. During the Korean War, when all natural rubber purchases were made exclusively by the United States Government, it was possible to analyze all imports on a quality basis. After extensive analysis it was found that 41.6 percent of all natural rubber imported into this country in 1951 was of a quality below the grade contracted for.⁸ This is in sharp contrast with synthetic rubber, where manufacturers buy according to their own specifications.

Recently, however, as a direct result of the emergence of the synthetic rubber industry as a permanent large-scale competitor, attempts have been made to improve this situation. A series of yearly conferences was inaugurated in April of 1954 to discuss major natural rubber problems. Delegates have included representatives of both exporting and importing countries. Natural rubber quality, including poor packing, moisture in bales, mixture of grades, etc., have been prominent topics of discussion. New grade specifications have been adopted and accepted by producing and consum-

⁸ In addition to upgrading, sloppy packing by some overseas shippers has represented a major point of contention between rubber importers and Far Eastern suppliers. See Rubber Manufacturers Association, Inc., *Annual Report*, 1952; *Rubber Age*, January 1953, p. 504; and "Current Problems in Shipping Natural Rubber," *Rubber Age*, December 1953, pp. 383-94.

ing countries alike. Trade sources report that results have thus far been encouraging and that quality and condition claims against Far Eastern shippers have been slowly diminishing.

Costs. Natural rubber costs vary substantially between producing countries but it is generally stated that rubber can be produced on an efficient plantation for as little as 12 to 15 cents per pound.⁹ In addition, there appears to be only a slight correlation between cost and size.¹⁰ However, there does appear to be a significant negative correlation between costs and yield per acre.

This latter conclusion is highly important. With labor shortages developing in some producing countries and with wages rising in others, higher productivity (yields per acre) appear to be the principal means of reducing natural rubber costs. Although mechanical tapping is still in the realm of imagination, two factors seem to point to increased productivity in the near future. First, by proper replanting, the yield of rubber per acre can be increased many fold. Such replanting is already being undertaken in many areas.¹¹ Much work remains to be done, especially on the numerous smallholdings. With proper education and financing, it would appear that increased yields could outstrip rising labor costs. And further intensive breeding could produce still higher yielding clones.

⁹ The estimate of the B. F. Goodrich Company was 12 cents per pound. See *Business Week*, September 7, 1957, p. 128. More extensive data is supplied by P. T. Bauer, *The Rubber Industry* (Cambridge, Massachusetts: Harvard University Press, 1948), especially pp. 269-75.

¹⁰ One explanation for this phenomenon is that natural causes of low yields—disease, soil erosion, temperature—are no more likely on small units than on larger units.

¹¹ See W. C. Taylor, *The Firestone Operations in Liberia* (Washington, D. C.: National Planning Association, 1956); and D. M. Phelps, *Rubber Developments in Latin America* (Ann Arbor, Michigan: University of Michigan, 1957).

Second, there has been a more recent new technical development of great importance which is about to be put into large commercial use.¹² Known as stimulation, the method requires a very small dose of particular chemicals applied at infrequent times. Extensive experimentation indicates: (a) such treatments actually improve the health of rubber trees and (b) a twenty-five to forty percent increased yield can be obtained by this method—both at an insignificant expense.

McGavack concludes that these facts mean "that a would-be producer of natural rubber can plant today and instead of turning up with a plantation that will produce 400 pounds of rubber per acre each year he can expect a return of 1800 pounds per acre each year. Furthermore when this 1800-pound yield is realized, he can apply stimulation in a modest way and expect 2350 pounds per acre. This is almost a sixfold yield, and will enable the producer to pay a higher wage scale and still make a profit."¹³

Price. Historically, natural rubber prices have borne little relationship to production costs. Production costs will have little or no significant effect upon price as long as world markets will absorb the available supply at much higher prices. Further advances in rubber chemistry appear certain to eliminate differences in quality and perhaps to narrow the gap in prices. But since 1943 (except for 1949), the average annual price of the most nearly comparable grade of natural rubber has been higher than the price of SBR.

The base prices of synthetic rubbers have remained constant since the industry was transferred to private owner-

¹² This discussion owes much to an article by John McGavack, "The Future of Natural Rubber," *Rubber Age*, February 1959, pp. 789-94.

¹³ *Ibid.*, p. 794.

ship in 1955. In contrast, natural rubber prices vary from day to day and show wide fluctuations over a period of years. The two rubber control schemes were in part responsible for this variability. Natural rubber prices are also particularly sensitive to political disturbances which block or threaten supply. For example, the price of natural rose from 27.8 cents per pound (second quarter of 1950) to 73 cents (first quarter of 1951) after the attack on Korea. Changes in internal political situations are equally important. Over a longer period general business conditions in consuming countries, principally the United States, raise or depress prices of imported crude rubber.

Price stability has two main appeals to both the synthetic rubber industry and to rubber buyers. First, the large rubber fabricators find stability a relief since for decades they have been at the mercy of a wildly fluctuating price of natural rubber and, in large measure, their gross profit margins have been outside of their control. Second, rubber fabricators cling to their belief that stability of synthetic rubber prices will, in the long run, reduce fluctuations in the price of natural rubber.

Whether natural rubber price fluctuations will become dampened in future years is subject to speculation. Consistently the United States has refused to take part in schemes for such stabilization through the creation of buffer stocks or other types of international commodity agreements. Moreover, the failure of the Stevenson Plan and International Rubber Regulation Agreement of 1934-44,¹⁴ ostensibly because they pro-

tected inefficiency and encouraged production in areas that could not be controlled, indicates the difficulties involved in establishing an effective agreement. Thus it would appear that a combination of increased productivity, and hence supplies, and the price of synthetic rubber will in the long run fix a ceiling on natural rubber prices.

A ceiling on domestic imports of natural rubber, at least in the immediate future, seems to have been established by the growth of the American synthetic rubber industry. But this development does not constitute a threat to the continued expansion and prosperity of the natural rubber growing industry. Outside of the United States and Soviet Russia, the use of synthetic rubber, in spite of recent gains, has not attained large volume. And although synthetic production capacity outside the country is increasing, world production has not reached a significant level. Many foreign manufacturers of tires and other rubber products, except those affiliated with American companies, still lack chemical engineers who know how to use synthetic rubbers. Even more important, European rubber manufacturers can buy natural rubber with sterling and other currencies, but need dollars to pay for synthetic rubber imports from the United States and/or Canada.¹⁵

For the enlarged natural rubber production due to begin in the mid-1960's, expanding world markets outside of the United States will be available. The manufacturers of rubber products in the producing countries themselves will take an increasing share of the output of crude rubber. And the growing rubber consumption of Western Europe, Australia, Japan and South America will, it now

¹⁴ These two plans represented attempts by natural rubber producers to control prices by restricting exports. While prices rose under the plans, both failed when producers increased their rubber production in those areas where restrictions did not apply. See United States Tariff Commission, *Rubber* (Washington, D. C.: United States Tariff Commission, 1944), pp. 37, 41-43.

¹⁵ This last advantage for natural rubber over synthetic will tend to diminish as synthetic capacity is increased abroad.

seems, be supplied principally by imports of natural rubber, a product they can purchase with sterling.

Foreign per capita consumption is still low, measured by American standards. 1957 usage of rubber was as follows:

Country	Lbs. Total Rubber per Capita	Lbs. Synthetic Rubber per Capita	Percentage Synthetic
United States.....	19.2	12.1	63.2
Canada.....	11.6	6.3	53.8
Australia.....	11.4	3.5	31.1
Great Britain.....	10.4	2.5	24.0
France.....	9.4	2.5	27.0
Western Germany..	7.7	2.0	25.7
Netherlands.....	4.7	0.9	19.3
Argentina.....	4.2	0.5	12.1
Italy.....	3.6	0.9	23.8
Japan.....	3.5	0.3	9.1
Brazil.....	1.4	0.03	2.1
India.....	0.2	0.02	8.7

If freedom from major political disturbances and continued growth in national income in these countries can be assumed, foreign rubber consumption will continue to rise. Tremendous growth possibilities still remain for the natural rubber growing industry.

National Security and Foreign Policy

With the rise of the domestic synthetic rubber industry, United States dependence on foreign sources of supply for rubber has decreased sharply. In the event of another global conflict, this country would not face a duplication of the situation which existed in 1939-41. The new private synthetic rubber industry stands on its own feet, receiving neither tariff protection nor subsidies. As far as domestic rubber supply is concerned, national security seems to have been satisfactorily attained.

But the achievement of national security has been viewed with great apprehension by natural rubber exporting countries. In Southeast Asia and elsewhere the prosperity of rubber producers in the

postwar years has been affected and will continue to be affected by domestic policies. Without exception rubber exporting countries are underdeveloped areas. In the national interest the United States has adopted a policy of aiding such countries to help them attain higher standards of living, primarily through greater economic efficiency. The ultimate goal, at least politically, is that through economic progress emerging democratic institutions will be strengthened, thereby making these countries less vulnerable to Russian influence and penetration.

In the struggle between East and West, Southeast Asia occupies a critical position.¹⁰ In Malaya, Indonesia and Indochina, internal political institutions continue to be unsettled and in their foreign policy are committed neither to East nor West. For both Malaya and Indonesia, rubber exports provide the largest single source of foreign exchange and furnish a large percentage of annual government revenue. Consequently, their apprehension over the growth of the synthetic rubber industry is not hard to understand.

Thus far these fears have not been realized. Sales of natural rubber, although supplying a declining proportion of domestic and world markets, have not actually fallen off. Natural rubber has a market of its own: its valuable characteristics have not yet been duplicated by any synthetic rubber produced on a commercial scale and at a competitive price. In products where both natural and synthetic can be used, the former is tending to become more competitive on a price and quality basis. Moreover, given the increases in productivity now occurring on natural rubber plantations and

¹⁰ See E. S. Mason, *Promoting Economic Development: The United States and Southern Asia* (Pasadena, California: Castel Press, 1955) and *Economic Planning in Underdeveloped Areas* (New York, New York: Fordham University Press, 1958).

small holdings, it is more than a probability that natural rubber producers will reduce their price substantially, even below the 23-cent level at which SBR now sells, in order to hold markets. Should this occur, evidence suggests that natural rubber producers would still be able to earn a liberal return on their investment.

Yet the decrease of domestic rubber imports raises some serious questions for this country. Exports of rubber (along with tin) from producing countries are a source of dollars with which imports from the United States are paid. This country has many direct interests in Southeast Asia that continued foreign trade can further. And the elimination of the American market has led to the development of bilateral trade between this vital area and Communist countries, particularly China—a development which the United States does not regard as being in its interest.

Conclusions

The natural rubber producing industry is now faced with a financially strong and technologically progressive synthetic rubber industry. Can the natural rubber industry meet this new competition or will the industry gradually decline and eventually decay?

Natural rubber can compete successfully with synthetics only if production efficiency can be increased in the next few years. In Southeast Asia and elsewhere thousands of acres of land are devoted to natural rubber production. The range in costs and efficiency between locations and estates is great. Many marginal producers, because of failure to replant sufficiently and also other inefficient

practices, tend to reduce operations when natural rubber prices are low. As a result natural rubber supply and price vary considerably from year to year. To increase the efficiency of these estates is a difficult job at best.

Most rubber producing countries are aware of the need for improving efficiency. In recent years quality has been improved (but more remains to be done). Higher-yielding trees have been planted and hundreds of acres replanted, aided in large part by financing and loans by the governments of the producing countries. These two factors, combined with new technological discoveries, would seem to indicate that natural rubber costs can be reduced in the near future. Moreover, the price of synthetics would appear to place a ceiling on natural rubber prices, at least in the long run. The result would be much less erratic price fluctuations for natural rubber than in the past. World and internal political conditions, however, will continue to play an important role in the supply of crude rubber.

If producers can increase their production efficiency through better land utilization and higher productivity, the continued expansion and prosperity of the natural rubber growing industry does not seem to be threatened. Besides having important qualities not yet imitated by a commercially produced synthetic, natural rubber is still clearly preferred by many foreign rubber manufacturers. Upon the success of increasing efficiency may well depend the continued economic development of these raw material producing areas.

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Empirical Studies in the Economics of Slum Ownership

By ARTHUR D. SPORN*

WHILE the subject of slum profiteering has received almost limitless journalistic coverage, seriously documented studies of the economics of owning and renting substandard housing are rare.¹ Detailed and quantitative economic studies of slum housing have much more frequently approached the problem from the tenant's point of view. The reasons for this predominance in approach are perhaps understandable. Slum tenants are as a group much more accessible than their landlords, who have often proven difficult to locate even for law enforcement officials armed with compulsory process, and, even if he could be located, the problem of inducing the usual slum property owner to make his records available to the investigator would remain.

In Wisconsin a highly unusual opportunity for studying the economics of slum ownership exists owing to the fact that the state's income tax returns are available for inspection for research purposes.² The comparative rarity of such an opportunity is emphasized by the fact that federal income tax returns are in general open to inspection only by employees of the Internal Revenue Service, state tax officials, and Congressional committees,³ while the use of state returns to investigate many of the cities where such a study might prove most valuable is foreclosed by the fact that the pertinent taxing

jurisdiction either imposes no local income tax⁴ or preserves for its returns a degree of secrecy as great as or greater than that maintained by the federal government.⁵

The availability of the Wisconsin income tax returns prompted the writer in 1958 to 1960 to investigate the ownership history and the owners' financial operating record for two separate samples of substandard housing in the City of Milwaukee. The initial purpose of the study was to obtain data on the frequency with which the properties had changed hands and the rates at which they were being depreciated for income tax purposes, and also as to the relation between the market price of such properties and the price at which they might be acquired by a public agency in eminent domain. These data were sought to test two separate hypotheses:⁶

(1) that the availability under state and federal income tax laws to successive purchasers of residential property of repeated depreciation deductions, based upon each owner's separate acquisition cost, stimulates an unhealthy turnover in such property by encouraging each owner to operate it irresponsibly while writing it off in the shortest possible time and then to pass it on to a purchaser who repeats the process; and

(2) that the prospect or actuality of condemnation proceedings to acquire substandard housing exerts an inflating effect on its market price, with the result that the process of

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¹For one of the few studies with which the writer is familiar, see Leo Grebler, *Experience in Urban Real Estate Investment* (New York, New York: Columbia University Press, 1955), pp. 183-6 ("Profits from Slums").

²See Wis. Stat. § 71.11(44)(c) (1959).

³See Internal Revenue Code of 1954 §§ 6103-6106.

⁴E.g., Illinois, Michigan, New Jersey and Ohio.

⁵E.g., 47 District of Columbia Code § 1564c (1951 ed.); 81 Annotated Code of Maryland § 300 (1957 ed.); 59 McKinney's Consol. Laws of New York Ann. §§ 202, 384, 386-j (Perm. ed.); 72 Purdon's Pennsylvania Statutes Annotated § 3402-506(c) (Perm. ed.).

⁶See A. D. Sporn, "Some Contributions of the Income Tax Law to the Growth and Prevalence of Slums," *Columbia Law Review*, December 1959, p. 1026.

public acquisition confers an indirect subsidy upon such property's owners.

The immediate results of these investigations, and their possible bearing on the hypotheses mentioned, are reported and discussed below. In addition to this information an item believed to be of even more general interest and significance emerged: it proved possible in a number of cases to determine the rate of return which the property was yielding to the owners on their capital investments.

The Properties Studied. The principal sample investigated was a group of properties on Milwaukee's near north side in the area bounded by West Walnut, West Cherry, North 11th and North 6th Streets. These properties are currently (1960) being acquired by the Milwaukee Redevelopment Authority in connection with its Hillside Neighborhood Redevelopment Project UR Wis. 1-2. Of the 155 parcels into which the Authority has divided the area for acquisition purposes, 128 contained buildings devoted either wholly to residential or partly to residential and partly to commercial use, and these last 128 comprised the subject proper of the study.⁷ The buildings included brick, brick and frame and frame structures ranging in height from one to three stories and in age from 30 to 75 years, with an average age of 57.4 years. They contained an average of 2.4 dwelling units per structure. While the condition of the buildings varied widely the area in general was considerably run down and was determined by the Milwaukee Common Council to be blighted and in need of redevelopment in November 1958.

In addition to the Hillside Project, the study covered a dozen purely residential

properties located throughout the city which had been found guilty of repeated violations of the Milwaukee Housing Code⁸ (convictions ranged from 18 to 73 in number) and which were suggested by the Housing Division of the Milwaukee Health Department as representative of the worst offenders in the city. The buildings involved ranged in age from 30 to 75 years with an average age of 64 years, and an average of 19.6 dwelling units per structure. While the same information (except for that pertaining to public acquisition) was sought for these properties as for those at Hillside, the data obtainable for the former proved much more fragmentary. Principally, this was because among the Health Department properties the corporate form of ownership was much more prevalent, and the Wisconsin income tax returns somewhat irrationally permit a corporate taxpayer to lump all of its rental properties in a single account in reporting its operating results but require individuals and partnerships in reporting to detail separately their results for each separate property held.

Ownership Turnover. The record ownership of each property studied was traced for the thirty years from 1929 through 1958. A period thus limited was chosen chiefly because ownership history was of interest primarily in the attempt to establish whether there was any correlation between frequency of transfer and income tax depreciation practice; and depreciation figures proved to be available only for the nine-year span from 1949 to 1957. From the ownership record the number of bona fide conveyances undergone by each parcel was determined.⁹

⁷ Milwaukee Code of Ordinances, Chapter 75.

⁸ The classification of transfers as bona fide conveyances was basically the same as that employed by Leo Grebler in his comprehensive study of the history from 1900 to 1950 of some 958 parcels on New York City's Lower East Side. In brief, all transfers were considered as bona

⁹ While the Hillside data for buildings partly residential and partly commercial were recorded and analyzed separately from that for those entirely residential, no significant difference in the characteristics for these two groups appeared and consequently the data for the two are lumped in the results reported and discussed herein.

The results of this study and classification appear in Table I.

TABLE I—BONA FIDE CONVEYANCES UNDERGONE BY HILLSIDE AND HEALTH DEPARTMENT PARCELS: 1929-1958

	Hillside Project		Health Department Parcels
	Number Parcels	% of Total	
0.....	10	8.1	1
1.....	37	30.1	1
2.....	28	22.7	5
3.....	25	20.3	3
4.....	10	8.2	
5.....	8	6.5	
6.....	5	4.1	2
	123	100.0	12

The average number of Hillside bona fide conveyances was 2.3; the median, 2.5.

Depreciation Rates. While the Wisconsin Department of Taxation has retained the income tax returns filed with it since the inception of the tax in 1911, the returns' depreciation schedules are systematically preserved only for the nine most recent years. Hence, it was possible to obtain depreciation figures only for the period 1949-57. These data were obtained for 95 of the Hillside and 11 of the Health Department properties; the

distribution of rates among these is shown in Table II.

TABLE II—RATES AT WHICH HILLSIDE AND HEALTH DEPARTMENT PROPERTIES WERE DEPRECIATED UNDER THE WISCONSIN INCOME TAX: 1949-1957

Depreciation Rate	Hillside Project		Number of Health Depart- ment Properties to which Applicable
	No. of Properties to which Applicable	Percent of Total	
2-2.9%.....	21	16%	6
3-3.9%.....	50	39	2
4-4.9%.....	18	14	9
5-5.9%.....	30	23	2
6-9.9%.....	5	4	5
10%.....	4	3	1
	128 ¹	100	25 ¹

¹ These totals exceed the number of properties covered since a single building was usually depreciated at different rates by successive owners, and sometimes by a single owner, during the period investigated.

The rate referred to is in each case that applicable to the principal structure; fixtures and improvements were usually separately depreciated at a considerably faster rate. Depreciation on all properties studied was taken on a straight line basis; the Wisconsin Department of Taxation has not sanctioned any of the accelerated methods permissible under the federal tax.¹⁰

The average depreciation rate, weighted to take into account number of tax years (but not size of capital investment) to which applicable, was 3.8% for the Hillside properties and 4.7% for those in the Health Department group. The median depreciation rate for the former was 3.9%.

Correlation Between Depreciation and Turnover Rates. Since depreciation was obtainable for only 9 of the 30 years for which ownership turnover was investigated, no definitive analysis of possible correlation between them was possible.

¹⁰ See CCH Wisconsin Tax Reporter (Chicago, Illinois: Commerce Clearing House, Inc., 1959) Vol. 2, para. 200-664.

(Continued from page 334)
fide sales and hence as bona fide conveyances unless indications to the contrary appeared in the record. Tax foreclosures and both mortgage foreclosures and voluntary surrenders where possession was taken by an institutional mortgagee were counted only when the property was subsequently conveyed out to a private purchaser within the period investigated and then the two stages were counted (unlike the method of the Grebler study) only as a single bona fide conveyance. While such a sequence of events could hardly be equated to a voluntary transfer it seemed appropriate to take it into account in view of the possibility it afforded of a new cost basis for depreciation purposes. Excluded as bona fide conveyances were death transfers, inter vivos conveyances within a family, agent-principal conveyances (chiefly intermediate transfers involving a real estate broker), conveyances to nominal corporations, and miscellaneous transfers such as quitclaim and correction deeds. See Leo Grebler, *Housing Market Behavior in a Declining Area* (New York, New York: Columbia University Press, 1952), Chapter VI and Appendix G, for a fuller description of this classification scheme and of the methods employed and the uncertainties inherent in assigning transfers within it.

Even if one adopted the tenuous assumption that the properties being depreciated at a rapid rate from 1949 through 1957 were those that experienced the same treatment throughout the 30-year period, no significant correlation emerged: the high turnover properties, those that had experienced 6, 5, and 4 bona fide conveyances, showed average depreciation rates of only 3%, 4%, and 4% respectively, compared with an average for the entire sample of 3.8%; while the high depreciation properties, those subjected to rates of 10%, 6-10%, and 5-6%, showed a bona fide conveyance average of 2.8, 2.8 and 2.3, respectively, compared with 2.3 for the sample as a whole.

Return on Capital Investment. In the case of 48 owners of 45 properties in the Hillside group and four owners of two of the Health Department properties, it proved possible to construct from the returns the taxpayers' capital investment, since the returns showed not only the original purchase price but also all improvements subsequently made and the various rates at which the different capital items were being depreciated. When such a return also indicated the owner's net profit for the year, it was also possible, of course, to determine his rate of return on capital invested. All periods during which any property was (partially) owner occupied were excluded from these calculations on the ground that the net profit in such a case almost undoubtedly represented, to an indeterminable extent, a return on such taxpayer's labor as well as on his capital investment. The results of these determinations appear in Table III.

The average rate of return on the Hillside properties, weighted to take into account the number of years (but not the size of capital investment) to which applicable, was 19.8%.

Redevelopment Authority Acquisition Prices and Owner's Invested Capital. The informa-

TABLE III—RETURN ON OWNERS' INVESTED CAPITAL IN HILLSIDE AND HEALTH DEPARTMENT PROPERTIES, 1949-1957

Rate of Return	Number of Taxpayers to whom Rate Applicable	
	Hillside Properties	Health Department Properties
Under 2%.....	2	1
2-3.9%.....	2	1
5-6.9%.....	2	—
7-9.9%.....	5	—
10-14.9%.....	13	1
15-24.9%.....	13	—
25% and over..	11	1
	48	4

tion that the Milwaukee Redevelopment Authority proposed to acquire the Hillside properties for its project was first released to the public in March 1957. The Authority began to acquire the properties, through purchases negotiated with their owners (occasionally with the intermediate step of obtaining a purchase option), in November 1959; and the process of acquisition, through negotiation and condemnation, was still going on in June 1960. The number of conveyances that took place in the sample between the time the Authority's proposed action became public and the close of the period surveyed was insufficient to permit any evaluation of the direct impact of the pending redevelopment upon the market for the properties affected. But, apart from this paucity of conveyances, any attempt to analyze the market effect of imminent public acquisition by a comparison of the sale prices before and after news of the redevelopment was released and by a comparison between such prices and the eventual public acquisition price would have encountered a further difficulty. That is, that while it would have been possible to trace these prices for a given property,

the sequence would hardly have any significance unless any intermediate improvements which the owners might have made between successive sales were taken into account. For the most part, information concerning such improvements was not available.

In the case, however, of the properties already mentioned for which it was possible to construct the owners' total capital investment, this difficulty could in part be overcome. Where such owners' invested capital as of December 31, 1957, was determinable, if one adopts the plausible assumption that there were no substantial capital improvements made in the approximately two years between that time and the Authority's purchase (more precisely, that any such improvements did not substantially exceed further depreciation), the relation between acquisition price and invested capital should be of considerable significance. This relation appears in Table IV.

TABLE IV—RATIO OF AUTHORITY'S ACQUISITION PRICE TO VENDOR'S INVESTED CAPITAL AS OF DECEMBER 31, 1957

Ratio ¹	Number of Properties to which Applicable	Percent of Total
Less than 1.00....	3	7.7%
1.00-1.49.....	4	10.3
1.50-1.99.....	5	12.8
2.00-2.49.....	11	28.2
2.50-2.99.....	5	12.8
3.00-3.99.....	4	10.3
4.00-4.99.....	2	5.1
5.00-5.99.....	3	7.7
6.00 and over..	2	5.1
	39	100.0%

¹ The acquisition prices on which these ratios are based were the Authority's actual gross purchase price, or the price at which it had obtained a binding purchase option, in every case but one, where the ratio is based upon a proposed acquisition figure for which the Authority had obtained the initial approval of the federal Urban Renewal Administration.

The average ratio for the group was 2.89.

Evaluation and Discussion

The frequency with which the Hillside properties changed hands (an average of 2.3¹¹ and a median of 2.5 bona fide conveyances per parcel during the period surveyed), although high enough to be compatible with a practice of rapid writeoff and turnover, cannot be considered excessive or even exceptionally high for the type of property concerned. Moreover, the rates at which these properties were being depreciated for tax purposes, an average of 3.8% and a median of 3.9%, are hardly such as to warrant questioning as excessive, even in the occasional case where depreciation ranged as high as 10%, in light of the general age and condition of the buildings concerned. As mentioned, no complete measure of correlation between depreciation and turnover was possible.

In view of the nature of the property surveyed, it is doubtful whether one can draw any conclusions from this data as to whether a pattern of rapid income tax writeoff, encouraging frequent changes in ownership, is prevalent in our cities today. The Hillside neighborhood is too sprawling and sparsely built up to be representative of the more intensively developed, densely occupied tenement neighborhoods found in many metropolitan centers larger than Milwaukee.¹² About all one can say is that, if a significant pattern had emerged in the instant

¹¹ This figure, indicating that the average Hillside parcel changed hands every 13 years, compares with a change on the average of every 10 years among old-law tenements and on the average of every eleven years among all properties surveyed, in Grebler's study of New York City's Lower East See Grebler, *op. cit. supra* note 9, pp. 75-77.

¹² Indeed, there is some question as to how indicative the results of slum landlords operating anywhere in Milwaukee would be of the pattern of more intensive exploitation found in many larger cities, in view of the Milwaukee Health Department's unusual record of long term effective enforcement of the City's Housing Code. See Miles L. Colean, *Removing Our Cities* (New York, New York: Twentieth Century Fund, 1953), pp. 45-47.

sample, one might reasonably have inferred its presence in more pronounced form in areas of the latter type. In this connection it may be significant that the properties suggested by the Health Department, with their more substantial structures believed to be more representative of those to be found elsewhere, showed appreciably higher turnover frequency (an average of 3.50 against 2.26) and depreciation rates (an average of 4.7% against 3.8%) than did Hillside, although one must add the caution that the Health Department sample proved too small to permit drawing any definitive conclusions from it. The Health Department results, as well as the higher rate of turnover reported in the New York City study mentioned in Footnotes 9 and 11, suggest that it would be worthwhile to investigate the correlation in a more typical large city tenement neighborhood—presumably employing federal income tax returns if these could be made available.

The results as to the owners' return on capital are believed to speak for themselves. With almost a quarter of the group surveyed showing an annual return greater than 25%, it is hard to avoid the conclusion that, for many property owners in the Hillside area, substandard housing represented a very profitable investment indeed. And the figures reported are undoubtedly on the conservative side since all deductions claimed by the taxpayer were accepted at face value in determining his net profit; the size of the repair deductions taken on a number of returns suggested that some of the items claimed were more properly classifiable as capital improvements.

In the case of the few properties showing a poor yield, heavy repairs appeared to be the principal factor responsible, along with a 10% depreciation rate in one case and the apparent current pay-

ment of several years' back taxes in another. The four Hillside properties yielding a net return of less than 4% all reported substantial gross rentals but showed an average ratio of net to gross income of only 7.1%.

The discrepancy between the prices paid for the properties by the Redevelopment Authority and the invested capital of the persons bought out also seems to require little comment. Undoubtedly, a portion of this excess is accounted for by the current expensing and the ultra-rapid writeoff of capital improvements just referred to, and in good measure by the steady rise in price levels that has occurred in recent years. But even if generous allowance for these factors is made it is hard to conclude that a process in which almost 30% of the persons affected are bought out at a price more than three times their investment is not exerting a subsidizing influence. The figures suggest that in at least some of the blighted urban areas now being reclaimed we may have reached a point where market prices are being set with a view to acquisition in condemnation proceedings and not vice versa.

In view of the unusualness of income tax returns as material for investigation and of the widespread speculation and interest as to the value of the federal returns in particular as a source of economic data, a word as to sources and methods in the instant study may be of interest. The writer's experience suggests that, for the detailed investigation of economic phenomena of any duration or complexity, the use of such returns confronts one with difficulties that may seriously limit their value.

The most obvious of these difficulties, and that most frequently encountered, was an inability to find any account at all of the property or transaction under investigation. This obstacle was confronted

at a number of stages. First, was an inability to locate any file at all for the party in interest indicated by other sources, such as the registry of deeds or the Redevelopment Authority's or Health Department's records. With the state returns here employed, this absence appeared in some cases attributable to out-of-state ownership, although such an owner is liable for the Wisconsin tax on income from local real estate. When located, the file frequently had returns missing for some of the years under investigation. In a few cases this seemed due to the taxpayers' having received less gross income than the statutory minimum (\$600) requiring the filing of a return but more frequently gaps were created by unexcused failure to file, followed by a default or doomage assessment. Even when a return was found the property or transaction under scrutiny was sometimes either missing or unidentifiable as the result either of simple omission or of the arbitrary difference already mentioned in the detail required for individual and for corporate returns.

Where a return did contain the details sought, further problems arose on account of inconsistencies between returns for successive years¹⁸ as well as from arithmetical errors and other discrepancies within a single return. Almost invariably these errors produced a result in the taxpayer's favor. The temptation initially arose to correct at least the more straight forward errors encountered but this was soon found to lead into a morass of reconstructing entire returns and a more practical policy had to be adopted of uniformly employing the taxpayer's figures except in the few cases where complete nonsense would have resulted.

¹⁸For example, an increase from one year to the next in the cost basis on which depreciation was being taken could readily be explained by additional capital improvements but returns for still later years in some cases showed a reduction to the original basis or to some other lower figure.

The difficulties just mentioned were undoubtedly intensified beyond the ordinary by the fact that the Hillside property owners included many persons of a low level of literacy and even a limited command of English. A few were persons with taxable incomes so low that they can hardly be criticized for failure to use greater precision or consistency in making out their returns; the extra trouble would not have been worth either their own while or that of the tax authorities. It should be mentioned, however, that the incidence of error, and especially of inconsistency from year to year, did not appear appreciably lower on those returns prepared with professional (or at least outside) assistance. Even in the case of persons making a genuine effort to compute accurately their tax liability, the attitude taken towards the prescribed details of the income tax return by the majority of taxpayers (and by their auditing officials) may be too practical a one to make the returns as valuable a source of data as their theoretical contents would indicate.

It should also be pointed out that, while these source difficulties necessarily limit the precision of the results reported, they are not believed to affect to any great extent such significance as these results may have, or that of the conclusions drawn from them above. This is so for two reasons. First, the general policy which was followed of accepting all figures reported by the taxpayer, particularly his deductions, at face value offers virtual assurance that the critical item of annual net profits and the rates of return based upon them, err on the conservative side. Secondly, in the case of all returns posing a problem of ambiguity, inconsistency, or omission, the practice was followed of resolving any doubt in favor of the alternative producing the most conservative result. For

example, in the case of those depreciation schedules that did not clearly indicate the owner's separate investment in land, in constructing his invested capital an allowance was made for this item which was considerably more generous than that indicated by the returns for comparable and more completely reported properties. It is not at all certain that such an allowance was necessary or warranted, in

view of the indications appearing on the Hillside returns that at least eight and possibly twenty or more of the owners were depreciating land along with their investment in improvements. Indeed, the returns suggested some question as to how widely the basic overall limitation of depreciation deductions to the total cost of the taxpayer's investment was being observed.

Land Value Trends in the United States†

By ERNEST KURNOW*

THE most recent prior study of land values under taxable property¹ by states was made in 1938. Subsequent studies were most likely not undertaken because of the lack of basic statistical data. The only continuing measure of land value under taxable property since that time (by Raymond Goldsmith in connection with his perpetual inventory of wealth) contains no data for individual states.²

The 1957 Census of Governments,³ however, has again made available the basic data that are needed to estimate land values by state. The present study was undertaken to make such estimates as well as to trace the trend and cyclical fluctuations in the distribution of land values among the states since 1922.⁴ This article reports the major findings of the study.

Method of The Study

Two steps were involved in the estimation of land values for this study. The first step required an estimate of the market value of real property for each state. The basic data were obtained from the 1957 Census of Governments.

† This study was made possible by a grant from the Lincoln Foundation. It is part of a larger study reported in, Joseph S. Keiper, Ernest Kurnow, Clifford D. Clark, and Harvey H. Segal, *Theory and Measurement of Rent* (New York, New York: Graduate School of Business Administration, New York University, 1959) mimeographed. Part of the study is to appear in a forthcoming book to be published by the Chilton Company, Philadelphia, Pa.

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¹ Taxable real property other than public utilities.

² Raymond W. Goldsmith, *A Study of Savings in the United States* (Princeton, New Jersey: Princeton University Press, 1955), Vol. III, pp. 11-38. More recent data may be found in current issues of the *Statistical Abstract of the United States*.

³ United States Department of Commerce, Bureau of the Census, *1957 Census of Governments, Volume V: Taxable Property Values in the United States* (Washington, D. C.: 1959).

⁴ Data for 1922 are from, United States Federal Trade Commission, *National Wealth and Income* (Washington, D. C.: 1926); data for 1930 and 1938 are from, Robert R. Doane, *The Anatomy of American Wealth* (New York, New York: Harper and Brothers, 1940).

The assessed value of property was first divided by the estimated ratio of assessed value to market value for each class of property.⁵ The market values, thus obtained for each class of property, were aggregated to determine the market value of property within a state.

The market value of real property includes the value of improvements in addition to the value of land. As a second step, therefore, it was necessary to separate out the value of land. Data for this purpose were obtained from the reports published by state agencies. Thirty-one states and the District of Columbia publish separate data for the assessed value of land. These figures were used to determine the proportion of real property value represented by land in those states. For nine of the 17 states for which published data were not available, the larger cities report aggregate data on the assessed value of land. These figures were used to estimate the land-to-real-property ratio for urban areas. In addition, the land-to-real-property ratios for farms and acreage were available for these states in state reports. The overall land-to-real-property ratio for a state was computed as the weighted average of the urban and farm and acreage ratios.⁶

The land-to-real-property ratios for the remaining eight states were based on appraisal data supplied by insurance companies. These eight states are among the smallest; in all they account for approximately 8 percent of the market value of real property in the United States.

⁵ Residential non-farm, farms and acreage, vacant lots, commercial and industrial, and all other.

⁶ For details see, Keiper, *et. al.*, *op. cit.*, appendix Table B. 11.

There are several limitations to the data and the method used in the study. The ratios of assessed value to market value estimated in the 1957 Census of Governments are based on a sample of measurable sales in each state. They are used in this study to estimate the value of all real property. It is, therefore, assumed that the ratios for sold properties reflect closely enough, for purposes of this study, the relation between assessed value and market value of all property. Furthermore, since sample data are used the ratios are subject to sampling errors.⁷

Although there are shortcomings in the Census data, they are far superior to the data available to earlier researchers. The assessment ratios used in prior studies were based on legal requirements and on the judgments of state officials. The use of the legally prescribed ratios—usually 100 percent of market value—was hazardous because such ratios were rarely attained in actual practice. The estimates based on the judgment of tax officials, in the absence of objective studies, were likewise subject to large errors. The net effect of these errors was to understate the market value of real property.⁸

There are additional shortcomings in the method used to separate land values from real property values. In the first place, it would have been more desirable to have had data on the proportion of land value to total value of real property for various classes of property. Such information would have been especially desirable since the Census of Governments enabled us to derive the market value of real property by class in each state. Unfortunately, only a handful of states have such data available and the Census of Governments did not collect

data on the assessed value of land and improvements separately.

In the second place, there exists some doubt as to the quality of the assessment data. Fortunately, there has been a marked improvement in recent years in the quality of the assessments, especially in the larger states. Since the war 41 states have provided assistance to local assessment authorities in one or more of the following ways: (a) preparation of assessment manuals, (b) preparation of forms for assessors, (c) the development of assessment systems, (d) conducting assessor schools, (e) programs for field training, and (f) provisions for tax map services.⁹ This assistance and the increasing prominence of professional organizations have done much to enhance assessment practices in recent years. Nevertheless, some weaknesses in the quality of the data do exist.

In the third place, the use of assessment data to determine proportions to be applied to the market value of real property assumes implicitly that the assessment ratios used apply equally to land and improvements. Thus, a ratio of .40 does not necessarily imply that both land and improvements were assessed at 40 percent of market value. To the degree that assessors are consistent no special problems are created. However, if there is a lack of consistency, then the use of assessment-based proportions might result in an overstatement or understatement of land values. If assessors, however, have been applying procedures as outlined in recently published manuals, the assessment ratios should apply equally to land and improvements. In addition, there is no evidence to show that such errors are all in one direction. In all likelihood there

⁷ The Department of Commerce used random samples of sales, and hence was able to estimate sampling errors. *See*, 1957, *Census of Governments*.

⁸ Keiper, *et. al.*, *op. cit.*, pp. 210-211.

⁹ Federation of Tax Administrators, *Equalization Programs and Other State Supervisory Activities in the Property Tax Field* (Chicago, Illinois: 1957) pp. 25-26.

is a tendency for such errors to cancel each other.

Land to Real Property Value Ratio

The basic data used to determine the ratio of land to real property value, as stated earlier, were derived mainly from state reports. In general, a similar procedure was employed in the earlier studies for the years 1922, 1930, and 1938. Since 1922 there has been a downward trend in the relative importance of land values as a component of real property value. This downward movement has been at a more rapid rate during the period 1938-56 than the period 1922-38—an average annual rate of decline of approximately 2 percent as compared to approximately 1 percent. Thus, land values accounted for 60.8 percent of all real property values in the United States in 1922, for 52.6 percent in 1930, and for 51.9 percent in 1938. By 1956, however, land values had decreased to only 36.0 percent of real property values. The same general pattern is reflected in the land to real property value ratios for each individual state.¹⁰ The decrease in the land to real property value ratio appears to contradict what is sometimes referred to as the "law of increasing rent." This "law" refers to the fact that with time the land-to-real-property-value ratio increases as the value of improvements decreases because of depreciation and obsolescence. If, in addition, the value of land were to increase during the same period because of progress in transportation facilities or other civic and industrial improvements, the ratio would increase more markedly.¹¹

It must be remembered, however, that this law refers to an individual piece of

real property over time and not to an aggregate of real property values. There is no doubt that the land-to-real-property value ratio is higher for all individual properties¹² that existed in 1922 and that were still in existence in 1956. The ratio for the aggregate of real properties, however, depends not only on the ratio for the properties that existed at the two dates but also on the ratio for the new properties built between the two dates and the proportion that the value of newly developed properties is to the value of the old. The land-to-real-property ratio for newly developed property is generally below the average for existing properties. Therefore, the aggregate land-to-real-property value ratio may remain constant and even decrease if the proportion of newly developed properties is high enough.¹³ It is not surprising, therefore, that the aggregate ratio fell between 1922 and 1956. This period, with the exception of the years between 1930 and 1945, was marked by great building activity.

Although the land-to-real-property ratios have decreased in each state, they follow the same general pattern in 1956 as in 1922. As a rule, the ratios are highest in states where natural resources, including fertility of the soil and minerals, are particularly important. City land values do not tend to affect the ratios decisively because there is a tendency for increases in urban land values to be balanced by the intensiveness with which urban land areas are improved.¹⁴

Land Value Trends: United States

The value of land (under taxable property other than public utilities) is

¹⁰ Federal Trade Commission, *op. cit.*, pp. 31-2; Doane, *op. cit.*, p. 195.

¹¹ See also, Raymond Goldsmith, "A Perpetual Inventory of National Wealth," *Studies in Income and Wealth*, Vol. XIV (New York, New York: National Bureau of Economic Research, 1951), pp. 33-4 (fn).

¹² *Cf.*, Federal Trade Commission, *op. cit.*, p. 34.

¹⁰ Ratios for individual states may be found in Keiper, *et al.*, *op. cit.*, appendix Table B. 11.

¹¹ With a possible exception of blighted urban areas, rundown mines, and certain agricultural properties.

estimated as \$243.7 billion for 1956. Land values increased from \$94.8 billion in 1922 to \$111.6 billion in 1930 (Table I) but declined during the depressed years of the thirties to \$94.2 billion in 1938.

TABLE I—TRENDS IN LAND VALUES UNDER TAXABLE REAL PROPERTY OTHER THAN PUBLIC UTILITIES: 1922-1956
(dollar figures in billions)

Year	Value of Land
1922.....	\$ 94.8
1930.....	111.6
1938.....	94.2
1956.....	243.7
1922-30	
Per cent change.....	17.7
Average annual rate.....	2.1
1930-38	
Per cent change.....	-15.6
Average annual rate.....	-2.1
1938-56	
Per cent change.....	158.7
Average annual rate.....	5.4
1930-56	
Per cent change.....	118.4
Average annual rate.....	3.0
1922-56	
Per cent change.....	157.1
Average annual rate.....	2.8

Sources: Keiper, et. al., *op. cit.* Appendix Table B. 12.

By 1956, as we have seen, land values had increased to \$243.7 billion.

The relative increase in land values was 17.7 percent between 1922 and 1930—an average annual rate of increase of 2.1 percent. Between 1930 and 1938 the value of land decreased by 15.6 percent—an average annual rate of decrease of 2.1 percent. Land values then increased 158.7 percent between 1938 and 1956—an average annual rate of increase of 5.4 percent. The rate of increase during this period is large because the depressed year of 1938 was used as a base.

More meaningful comparisons result in measuring the relative change between

1930 and 1956 and between 1922 and 1956. Land value increased 118.4 percent between 1930 and 1956—an average annual rate of growth of 3.0 percent. The rate of growth in land values during this period thus exceeded that of the 1922-30 period. Over the entire 34-year period the value of land increased 157.1 percent—an average annual rate of 2.8 percent.

The rate of growth in land values parallels the rate of growth in real property values. However, since the land-to-real-property value ratio has been decreasing over time, the rate of growth in land values has been slower than that of real property as a whole.¹⁵ Expressed in another way, the value of improvements has been increasing with greater rapidity than the value of land.

The slower rate of growth in land values as compared to real property values is in part due to the fact that the effect of price changes is more pronounced for improvements than for land. No indexes exist for the price of land. However, the United States Department of Agriculture prepares a farm real estate index which reflects changes in the price level of farm land and improvements. The Department also prepares indexes of construction costs of farm-operator dwellings and farm service buildings. The indexes of farm construction, which we will assume reflect changes in price level for farm improvements, increased approximately 165 percent between 1922 and 1956. The index of farm real estate, which reflects changes in price level of farm land and improvements, increased only about 66 percent during the same period. If we were to assume that the value of agricultural land accounts for about 70 to 80 percent of agricultural real property, the increase in the price level

¹⁵ The value of real property between 1922 and 1956 increased by 334.4 percent. See, Keiper, et. al., *op. cit.*, p. 221.

of agricultural land would have been approximately 25 to 40 percent between 1922 and 1956.

It is doubtful that the same degree of disparity exists between the changes in price level of urban land and of urban improvements. Even if we assume that the price movements for land and improvements parallel each other for urban lands, the rate of growth in aggregate land values would, nevertheless, be less than that of real property values because of the difference between price changes of agricultural land and improvements on that land.

The change in land values, in addition to reflecting changes in price level, is also influenced by the difference in the quality of the basic data available for this and earlier studies. As we have seen, the earlier studies tended to understate the value of real property and, since land values are computed as a proportion of real property values, land values were likewise understated. Such understatement in the earlier studies tends to exaggerate the increase in value of land, whether measured in current or constant dollars.

Comparisons of land value over time are also distorted by the fact that only the value of land under taxable property is being measured. The value of tax-exempt property has increased considerably since 1922.¹⁸ This flight of property from the tax base tends to understate the percentage change in land values.

Land Value Trends: Regions and States

The difficulties in comparing land values arising from changes in the price level, from differences in the quality of the basic statistics, and from changes in the relative importance of tax-exempt property can be avoided in large part by following the trends in the ratio of land

value in a state or region to that of the United States. The region-to-United States and state-to-United States land value ratios for 1922 and 1956 are presented in detail in Table II.

The table indicates that wide disparity exists in the trend of region-to-United States land value ratios and in state-to-United States land value ratios. In general, the greatest increases have taken place in those regions and states in which population and industrialization have grown most rapidly. The largest declines have occurred in the predominantly agricultural regions and states.

The greatest increases in land value ratios occurred in the Pacific region. In 1922 this region accounted for 9.1 percent of the total land value of the country. By 1956 its share had risen to 16.6 percent. The increase was due entirely to the phenomenal, more than five-fold, increase in land values in California. The land value ratios decreased for the other two states of the region—Oregon and Washington.

Other sizeable increases in the relative importance of land values took place in the South Atlantic and West South Central regions. In the South Atlantic states, the region-to-United States land value ratio increased from 8.9 percent in 1922 to 11.4 percent in 1956. Substantial increases in land value ratios occurred in Florida, North Carolina and Delaware. The ratios also increased for all other states but West Virginia, where the ratio decreased from 2.0 percent in 1922 to 0.8 percent in 1956.

In the West South Central region the the region-to-land value ratio increased from 7.5 percent to 9.3 percent. This increase reflects mainly the increase in land values in Texas. The increase in the ratio for Louisiana was counterbalanced by the decrease in the relative

¹⁸ Keiper, *et. al.*, *op. cit.*, p. 224.

importance of land values in Arkansas and Oklahoma.

TABLE II—VALUE OF LAND UNDER TAXABLE REAL PROPERTY (OTHER THAN PUBLIC UTILITIES) AND PERCENTAGE TO TOTAL UNITED STATES VALUE OF LAND FOR REGIONS AND STATES: 1922 and 1956
(dollar figures in millions)

Region and State	1956		1922	
	Value	Per cent of U.S. Total	Value	Per cent of U.S. Total
New England.....	9,735	4.00	4,162	4.39
Maine.....	690	.28	384	.41
New Hampshire.....	548	.23	226	.24
Vermont.....	333	.14	135	.14
Massachusetts.....	4,383	1.80	2,532	2.67
Rhode Island.....	606	.25	270	.29
Connecticut.....	3,175	1.30	615	.65
Middle Atlantic....	42,146	17.30	15,392	16.25
New York.....	21,465	8.81	7,589	8.01
New Jersey.....	7,289	2.99	2,061	2.18
Pennsylvania.....	13,392	5.50	5,742	6.06
East North Central.	46,697	19.17	21,718	22.92
Ohio.....	9,894	4.06	5,513	5.82
Indiana.....	6,126	2.52	2,685	2.83
Illinois.....	18,441	7.57	7,476	7.89
Michigan.....	8,806	3.61	3,294	3.48
Wisconsin.....	3,430	1.41	2,750	2.90
West North Central	31,939	13.10	21,341	22.52
Minnesota.....	4,762	1.96	4,141	4.37
Iowa.....	7,654	3.13	5,296	5.59
Missouri.....	6,141	2.52	3,529	3.72
North Dakota.....	1,961	.80	1,207	1.27
South Dakota.....	1,885	.77	1,707	1.80
Nebraska.....	4,059	1.67	2,630	2.78
Kansas.....	5,477	2.25	2,831	2.99
South Atlantic.....	27,911	11.44	8,417	8.88
Delaware.....	471	.19	114	.12
Maryland.....	2,585	1.06	672	.71
Virginia.....	3,535	1.45	1,215	1.28
West Virginia.....	1,942	.79	1,930	2.04
North Carolina.....	6,138	2.52	1,336	1.41
South Carolina.....	1,922	.79	636	.67
Georgia.....	3,712	1.52	1,126	1.19
Florida.....	6,342	2.60	1,018	1.07
Dist. of Columbia	1,264	.52	370	.39
East South Central.	11,391	4.66	4,258	4.50
Kentucky.....	3,038	1.24	1,087	1.15
Tennessee.....	3,122	1.28	1,505	1.59
Alabama.....	3,283	1.34	888	.94
Mississippi.....	1,948	.80	778	.82

West South Central	22,538	9.25	7,144	7.54
Arkansas.....	2,121	.87	1,036	1.09
Louisiana.....	3,621	1.49	782	.83
Oklahoma.....	3,056	1.25	1,300	1.37
Texas.....	13,740	5.64	4,026	4.25
Mountain.....	11,033	4.53	3,697	3.90
Montana.....	1,268	.52	729	.77
Idaho.....	1,803	.74	481	.51
Wyoming.....	600	.25	180	.19
Colorado.....	3,045	1.25	917	.97
New Mexico.....	848	.35	276	.29
Arizona.....	1,781	.73	585	.62
Utah.....	1,107	.45	394	.42
Nevada.....	581	.24	135	.13
Pacific.....	40,332	16.55	8,627	9.10
Washington.....	4,150	1.70	2,222	2.34
Oregon.....	2,885	1.18	1,402	1.48
California.....	33,297	13.67	5,003	5.28
TOTAL.....	243,722	100.00	94,756	100.00

Sources: Keiper, et. al., *op. cit.*, Appendix Table B. 12.

The region-to-land value ratio also increased but to a lesser extent in the Middle Atlantic and Mountain states. In the Middle Atlantic states the land values ratio increased from 16.3 percent to 17.3 percent. The major increase occurred in New Jersey with a slighter increase for New York. The value of land in Pennsylvania decreased as a percent of the national total. In the Mountain states the region-to-United States land value ratio increased from 3.9 percent to 4.5 percent with all states but Montana showing an increase.

The sharpest decline in the ratio of a region's land value to that of the country occurred in the West North Central Region where the ratio decreased from 22.5 percent to 13.1 percent. There was a sizeable decrease in the ratios for all states of the region.

Decreases in the relative importance of land values as part of the national total occurred to a lesser extent in the New England and East North Central regions. In the New England states the land

value ratio decreased from 4.4 percent to 4.0 percent. The decreases in the ratios for all other states of the region were almost offset by the increase in the ratio for Connecticut.

In the East North Central Region the ratio of its land value to that of the United States decreased from 22.9 percent to 19.2 percent. Michigan was the only state of the region that experienced an increase in its land value ratio.

In the only remaining region, the East South Central, land value ratios remained fairly constant, increasing from 4.5 percent to 4.7 percent. The stability in the land value ratio reflected the offsetting changes among the individual states of the region. Thus, land value ratios increased in Kentucky and Alabama; decreased in Tennessee; and remained constant in Mississippi.

The changes in the relative importance of individual states with respect to land values is also reflected when the states are ranked according to the magnitude of land values for each of the years 1922, 1930, 1938, and 1956.

California rose from a rank of 6 in 1922 to the top ranking state in 1956. Texas rose from 8th position to 4th position and Florida from 29th to 10th. Other states that improved their national ranking significantly include: (a) Connecticut, from 37th to 23rd; (b) New Jersey, from 17th to 9th; (c) Maryland, from 35th to 30th; (d) North Carolina, from 22nd to 11th; (e) Alabama, from 31st to 22nd; (f) Georgia, from 26th to 18th; and (g) Louisiana, from 32nd to 19th.

The states that dropped significantly in rank include: (a) Iowa, which dropped from 5th position to 8th; (b) Minnesota, from 7th to 14th; (c) North Dakota, from 25th to 32nd; (d) South Dakota, from 19th to 36th; (e) Oregon, from 21st to 29th; (f) Wisconsin, from 12th to 21st;

and (g) West Virginia, from 18th to 24th.

In general great gains in rank occurred in many of the South Atlantic and South Central States at the expense of the states in the West North Central Region.

Concentration of Land Values

The long-term trend has been toward greater concentration of land values among the states. A major contributing factor to this increase has been the tremendous growth in the land values in the state of California. This state alone, in 1956, accounted for approximately 14 percent of the value of land in the United States. The leading 5 states¹⁷ in that year accounted for 41.2 percent of the total value of land in the United States. In 1922, the leading 5 states¹⁸ accounted for only 33.4 percent of the total. The 10 top ranking states accounted for 57.6 percent of the total in 1956 as against 54.5 percent in 1922. The 15 top ranking states in both years, however, accounted for about 69 percent of the total land value.

The degree of concentration in land values also varies with fluctuations in general business activity. In 1938 the five leading states accounted for more than 44 percent of total land values—as compared to 41.7 percent in 1956 and 33.4 percent in 1922. In fact, the states of New York and California accounted for more than 25 percent of the total land value in 1938.

This high degree of concentration of land values in 1938 resulted from the ability of the industrial areas in the east, midwest, and the state of California to maintain the relatively high value of land. In other areas there was a sharp drop in land values. This diversity in the movement of land values reflects the fact

¹⁷ California, New York, Illinois, Texas, Pennsylvania.

¹⁸ New York, Illinois, Pennsylvania, Ohio, Iowa.

that the depression was less prolonged and less intense in industrial areas than in the agricultural sections of the country.

This paper confined itself to the presentation of data pertaining to the value of land under taxable real property—excluding public utilities. As yet very little information concerning the value of land under public utilities and tax-exempt property is available for states.¹⁹ Furthermore, there is a paucity of data

¹⁹ For national estimates of the value of land under public utilities and tax-exempt property *see*, Keiper, *et. al.*, *op. cit.*, pp. 263-73.

relating to the distribution of land values under different types of property. It is unfortunate that the recent Census of Governments did not record separate figures for the assessed value of land. Such information would have been useful in estimating the value of land under different types of property. More precise and more complete data on the distribution of land values by state must await the gathering of more comprehensive basic data than has heretofore been possible.

Welfare Economics and the Theory of Regulation

By LUCILE SHEPPARD KEYES*

Introduction

MANY of the policies and programs making up the legal framework for the conduct of business in this country can no doubt be explained as results of political pressures. Nevertheless, it is quite generally considered important to back up these policies and programs with justifications which are in some sense economic. To evaluate arguments for and against such measures; to improve them and, if need be, to formulate more desirable alternatives, the advice of the economist is often sought.

It should be the function of an economic theory of regulation to provide a body of more or less general principles on the basis of which the economist can give the sort of advice which is needed. Just what sort of advice this is—i.e., what distinguishes the economist's point of view from that of (say) the engineer, the efficiency expert, or the promoter of special interests—is one of the questions dealt with extensively by welfare economics. Economists concerned with regulation can profit by this discussion, since its subject is obviously fundamental to their field of specialization, and also because they not infrequently need to be safeguarded against the temptation to adopt non-economic points of view which are more readily understood, but already well represented by other specialists. Not that the economist cannot give professional approval to efficient techniques, lower costs, and proposals which benefit particular interests, *other things being equal*. It is the qualifying phrase which suggests the economist's special role. As the following study will bring out, the economist tries to make sure that *all* the conse-

quences of each action, as far as these can be reflected in money gains and losses, shall be taken into account.

A second aspect of welfare economics to be considered here is a suggested method of evaluating the effects of decisions affecting the production or purchase of goods, and the consequent definition of an optimum production and purchase situation in which all the good decisions have been made. Generally speaking, the suggested method of evaluation cannot be employed because this would require the use of non-available data; and similarly, the optimum cannot be reached because this would require the use of impossible forms of pricing. (The substitution of political decision-making seems even less likely to achieve the desired end.) Nevertheless, the study of this method and this optimum will suggest how present pricing methods, and hence both market data and economic performance, can be improved and incidentally will help to clarify certain important issues connected with price regulation.

A final helpful suggestion which the student of regulation can derive from the welfare economist is contained in the treatment of the conditions under which certain states of the market represent a real economic optimum. Some of these conditions can be brought about only by government action, and therefore provide acceptable objectives for some types of regulation.

In addition to these helpful aspects of welfare economics, the following study will take up briefly certain other suggestions which perhaps cannot properly be attributed to welfare economics itself but can be attributed to its incautious inter-

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pretation: first, the indiscriminate application of the rule that price should be equal to marginal cost; and second, the acceptance of pure competition as either a necessary or a sufficient condition for optimum output. Some attention will be given to a rather prevalent tendency to over-estimate the possible undesirable effects of price discrimination—a tendency which has to some extent been encouraged by arguments derived from welfare economics.

It would be wrong to give the impression that there is a body of recommendations (or perhaps even one recommendation!) subscribed to by all good welfare economists. Indeed, some of them strongly emphasize the difficulties of arriving at any recommendations on purely economic grounds. One of the most expert of these theorists has not only despaired of arriving at any such recommendations but has actually proposed, in all seriousness, that prices be set in accordance with the medieval principle of the *pretium justum*.¹

I. The Economic Point of View

In one sense, there is no such thing as a specifically economic point of view from which policies can be judged. That is to say, the economist's (presumed) familiarity with the factors and processes determining prices, outputs, and like variables does not in itself give him any special insight into the nature of the general welfare. No more than any other science does economic science produce value judgments. Thus Professor Samuelson, pointing out that the "claim that welfare economics can be solidly based on objective economic criteria" is "now admitted to be misguided," defines the "new welfare economics" as

"a systematic way of introducing from outside of economics various ethical norms (as embodied technically in what is called a social welfare function)—and so ordering the exposition of the conditions for an optimum that we first state those which require only the weakest postulates, and which therefore hold for the widest possible set of cases, and only later introduce the narrower and more restrictive hypotheses."²

Moreover, the economist's particular knowledge does not give him any special competence to defend the proposition that an increase in any individual's holding of any product, or a decrease in any cost of production, other things being equal, is a good thing. But of all possible "ethical" judgments broadly relevant to the state of economic variables, this judgment is perhaps the most widely acceptable; it is also capable of fruitful application to a very wide range of economic problems. Therefore, it is not surprising that the main body of welfare economics is very largely concerned with the implications of this value judgment and it does not seem inappropriate to label the resulting system of evaluation "the economic point of view." If any one prefers to call it "rudimentary ethics," or something else to that effect, he is at liberty to do so. Not every one, indeed, would be willing to accept the ethical implications of this judgment and of its direct application to economic affairs. Professor Boulding, for example, not only will not admit that, in general, "people should get what they

¹ Paul A. Samuelson, "Comment" on Kenneth E. Boulding's chapter on "Welfare Economics," in *A Survey of Contemporary Economics*, Volume II, Bernard F. Haley, ed. (Homewood, Illinois: Richard D. Irwin, Inc., 1952), p. 37. This chapter, with the comments by Boulding and Melvin W. Reder, is an excellent introduction to welfare economics. A very enlightening as well as entertaining perspective view of welfare economics may be obtained from Sir Dennis Robertson's two essays, "Utility and All That" and "Utility and All What?", the first of which is reprinted in the collection of essays by this author and bearing the same title (London, England: George Allen and Unwin, Ltd., 1952), the second in a later collection, *Economic Commentaries* (London, England: Staples Press, Ltd., 1956).

² J. de V. Graaff, *Theoretical Welfare Economics* (Cambridge England: Cambridge University Press, 1957), p. 142.

want"; he also regards as "practically indefensible" the proposition that "trading is ethically neutral."³ There is evidently enough weight in at least the first of these objections to warrant humility in applying our basic value judgment and a willingness to admit exceptions, for example, where obvious general evils result from certain people's getting what they want (e.g., switch-blade knives). Nevertheless, this judgment does represent the definite, unambiguous core of the very widely accepted postulate that it is desirable to increase the national product or national income.⁴

Because this judgment contains no qualification as to the recipient of the described benefits it should not be interpreted to mean that a given benefit must be regarded as of equal "value" no matter what its distribution. It does not mean, for example, that in the context of welfare economics the acquisition of a bushel of wheat by a starving pauper is necessarily no more desirable than the acquisition of the same bushel by Croesus. It does mean, however, that either acquisition is to be regarded as better than no acquisition at all. Although welfare economists do not attempt to define total economic welfare as some magnitude which is independent of the distribution of income and hence do not hold that economic welfare can be maximized without regard to income distribution, they have recognized that the specification of an optimum distribution of income is an extremely complex matter, subject to very considerable differences of opinion among men of good will. It is at least in part for this reason that a relatively large share of attention has been given to those economic decisions which

can reasonably⁵ be judged good or bad without having to evaluate any complex change in the interpersonal distribution of income: i.e., those decisions which involve a gain for at least one person and a loss for no one, or a loss for at least one person and a gain for no one. The first type is accounted desirable and the second, undesirable.

There seems to be only one way in which this principle can be directly applied to real economic decisions, which in the majority of instances bring about gains to some and losses to others; and this way is to assume that the gainers compensate the losers. Having assumed this, we may approve those changes which leave the gainers better off than before even when the losers are fully compensated, and disapprove those changes for which the necessary compensation payment exceeds the gain. The resulting rule has been stated as follows by Professor Reder: "an economic reorganization [change] will increase, decrease, or leave welfare unaffected according to whether the algebraic sum of the compensating taxes and bounties (levied on all affected persons) is positive, negative, or zero."⁶

⁵ If we pitch the discussion at the more ambitious level of defining an increase in "satisfaction" or "happiness," we must expressly assume away the possible ill effects of envy, or explain why we ignore them.

⁶ M. W. Reder, *Studies in the Theory of Welfare Economics* (New York, New York: Columbia University Press, 1947), pp. 16-17. In this context: "A tax (bounty) levied upon (paid to) a given individual is said to be 'compensating' if the amount of money taken from (paid to) him in the event of an economic reorganization leaves him on the (same) indifference surface he would have been on had the reorganization not occurred; i.e., a compensating tax (bounty) (a bounty is a negative tax) cancels ('compensates' for) the effect of a reorganization, leaving the individual on the (same) indifference surface he would have been on, had no changes in the situation occurred."

If we believe that certain output changes will affect the "allocative efficiency of the economy" (that is, the actual possibilities for inter-personal redistribution of real income), we shall have to take this effect into account when judging them; and the conditions for an unambiguous improvement are greatly complicated. For to say that the gainer from the movement from A to B could compensate the loser

³ Boulding, *loc. cit.*, p. 32.

⁴ The above-cited article by Boulding contains a most enlightening discussion of this point.

This convenient assumption regarding compensation, which appears at first to be quite false, may be justified in at least three ways: (1) by actually requiring the payment of compensation before approving any change in price or output that makes any one worse off; (2) by relying on the not unreasonable belief that in the long run almost every individual will probably find himself better off as a result of a series of changes—some good and some bad from his short-run point of view—but all of which satisfy the above condition as to net benefit;⁷ or (3) by providing for periodic reconsiderations of the distribution of income as a result of which any accumulation of losses by an individual or group might be corrected so as to safeguard against an uneven operation of the process proposed to be relied on in (2).

Since course (1) is obviously out of the question,⁸ and course (2) may not bring

(Continued from page 351)

and still gain, would not necessarily imply that the gainer from the movement from B to A could not compensate the loser from this move. Thus it becomes conceivable that the use of either of these tests can result in contradictory results: the test may, in other words, recommend both the movement from A to B and the movement from B to A. A valuable discussion of this point is in Graaff, *op. cit.*, pp. 84-90.

"If the economic activities of a community were organized on the principle of making no alterations in the organization of production which were not improvements in this sense [i.e., in the sense that the gainers would still retain a net gain after compensating the losers], and making all alterations which were improvements that it could possibly find, then, although we could not say that all the inhabitants of that community would be necessarily better off than they would have been if the community had been organized on some different principle, nevertheless there would be a strong probability that almost all of them would be better off after the lapse of a sufficient length of time." J. R. Hicks, "The Rehabilitation of Consumer's Surplus," *Review of Economic Studies* (1940-41) p. 111.

"Among other things, the identification of all those affected and the direct measurement of their gains and losses would be practically impossible. As Dr. Little puts it, 'Why not compensate all losers?' This is easily answered. We could not in practice, find out who had lost and how much would be required to compensate them. A complete knowledge of everyone's behaviour map would be required, because exactly to compensate someone is, theoretically, to raise him on to the same behaviour line as before. But we know nothing of anyone's behaviour maps, and, in any case, we have seen that most people have not the deep-seated habits required for us to be able to say that

about the desired result, course (3) seems to be preferable, and moreover quite satisfactory as a practical basis for decision-making. The proposed review of the distribution of income can conveniently be made in connection with the preparation of the national budget and tax program. Unlike a piecemeal plan for compensation, moreover, this sort of review can take into consideration the many-sided influence of the distribution of income on the general welfare; for example, its effect on incentives and the possible need to bring certain groups up to some minimum income in order to avoid undesirable repercussions on the community as a whole. The redistributive effect of the tax system, which occurs as a result of fiscal necessity regardless of deliberate intent to redistribute, can also be taken into account. (Separate treatment of these factors, in addition to piecemeal compensation, would in all probability result in a wasteful cross-transfer of income.) Does not something of this sort take place already in relatively advanced democracies?

From a slightly different point of view, it is possible to short-circuit the "compensation" difficulty by accepting the proposition that it is always a good thing for society to be placed in a position to make everybody gain if suitable provision is made for the correction of undesirable features of distribution which may in fact arise.

II. Methods of Evaluating Decisions

If we then feel justified in recommending any "reorganization" which results in a net benefit in the above sense, we may apply this principle to various common types of decision and arrive at the

they have a behaviour map." I. M. D. Little, *A Critique of Welfare Economics* (Oxford; England Oxford University Press, 1950), p. 97. In other words, objective direct evidence as to the necessary amount and distribution of compensation is highly unlikely to be available.

celebrated marginal equivalences which define (in part) the optimum state of all the outputs and inputs of the economic system.⁹ Interpreted as dealing with infinitesimal or unitary rates, these marginal rules are generally insufficient to judge all but the most trivial of output changes. This question will be returned to at a later stage. Meanwhile, we merely note that most investment decisions must be tested by the full comparison between compensatory taxes and bounties.¹⁰ For an increase in any output the maximum revenue which could be extracted by a

perfectly discriminating monopolist seems to be as good an indicator as is theoretically possible of the maximum compensatory tax which could be levied upon those who receive the output. It is not quite so good an indicator of the bounty necessary to compensate for the loss of the same output.¹¹ However, it appears that the other theoretically suitable indicators can be arrived at only by direct questioning of all those concerned, a method notoriously unreliable and administratively absurd.

In connection with any proposed output increase the compensatory tax which could be levied on the benefited consumers and producers must be offset against the compensatory bounties which would have to be paid to the disappointed recipients of the foregone incomes and outputs in the uses from which the necessary productive factors are drawn. With perfect discrimination in the product markets by all affected sellers these bounties would be roughly equal to the cost of producing the new output since

⁹In his *Foundations of Economic Analysis* (Cambridge, Massachusetts: Harvard University Press, 1947), Professor Samuelson summarizes the full first order conditions of equilibrium which must hold if we are to have an optimum of both production and exchange as follows (pp. 238-239): "(1) we must have a common marginal rate of indifference between any two goods for every individual; this common indifference ratio, must, moreover, be equal to the ratio at which one of these goods can be transformed into the other in a production sense, the transformation to come about as the result of transferring any resource from one goods' production to the other's. (2) We must have for all individuals a common ratio of indifference between supplying more of any factor of production and enjoying more consumption of a given good; this common ratio must be equal to the rate at which supplying more of that factor results in greater production of the good in question." A helpful arithmetical exposition of the first and second order optimum conditions is contained in Boulding, *loc. cit.*, p. 19-23.

¹⁰According to Dr. Graaff (*op. cit.*), there is no valid welfare rule for judging finite changes (p. 145 n.). In his opinion (p. 112), "all the convenient properties of the price system which enable us to say that (provided the distribution of wealth is approved) goods should go to the highest bidder, or that factors of production should be used where they earn most, break down completely when we have indivisibilities of this sort." (He is speaking here specifically of consumer goods that are not infinitely divisible.) He objects to the "consumer's surplus" type of calculation in part (1) because it does not properly take indirect effects into account, an objection which seems to be reducible to the point that pricing is not everywhere perfect, and also (2) because the necessary compensation payment would change the price system, and therefore the "value of the dollar" to each person concerned, and would therefore invalidate the original calculation as to costs and benefits. For these reasons, he says (p. 114), "It is simpler to tackle the problems raised by finite movements of any sort (and in particular by indivisibilities) quite directly, as we did in Chapter V. Any point on one of the diagrams of Chapter V represents a definite amount of ordinal utility for each of the members of the community. A movement to another point registers a change in these amounts. That is all we need to know." Needless to say, the diagrams of Chapter V were supplied wholly from the imagination of Dr. Graaff, and are hypothetical forms rather than data. The superior "simplicity" of this method is entirely at the level of theory.

This extreme view is not shared by most specialists in the field. According to Professor Samuelson, "The only remaining divergence of belief [among welfare economists] seems to be on pragmatic tactical questions: e.g., shall all changes which *could* make everyone better off but which might in fact hurt some people be made mandatory in the expectation or hope that the cumulative effects of following such a rule will be better (for all or some) than if some other rule is followed? [This is the question of compensation, discussed above.] Shall we set up a rule of unanimous consent for any *new* change so that compensating bribes must be in fact paid? To answer such questions," he concludes, "we must go beyond economics." "Comment," *loc. cit.*, p. 37 n.e.

¹¹There are several plausible measures of the gains or losses of a consumer from an increase or decrease in the output (and associated decrease or increase in the price) of some good; these are discussed in the above-cited article by J. R. Hicks and in Samuelson's *Foundations of Economic Analysis*, pp. 197-202. Of these, the so-called quantity-compensating variation (in income) appears most appropriate to measure "maximum compensatory tax" under the assumption that the price change and the associated change in purchase actually take place. For an increase in output this variation appears to be equal to the revenue obtainable by the perfectly discriminating monopolist; for a decrease in output, provided the good in question is not an "inferior" one, the revenue formerly obtained by the perfectly discriminating monopolist is somewhat smaller than the quantity-compensating variation.

the transfer earnings of each factor unit would be equal to the perfectly discriminatory value of its output in the old use. Where the old employer is a "large" buyer of any factor, so that his demand alone could affect its price, perfect discrimination in the factor market must also be postulated in order that money cost shall represent the correct value of the displaced output. We therefore arrive at the rule that any output increase is to be made for which perfectly discriminatory revenue exceeds perfectly discriminatory cost, provided that pricing is everywhere perfectly discriminatory. The difference between perfectly discriminatory revenue and perfectly discriminatory cost is customarily referred to as "surplus"—producer's or consumer's surplus, according to which party benefits. The distribution of the benefit is, of course, irrelevant to the determination of the optimum output.¹²

The use of market data as indicators of the gains and losses arising from any output change (always provided, of course, that distributional defects can be separately considered and corrected) has a great deal to recommend it. Indeed, with certain well-known exceptions,¹³ market data represent the best approximations of these gains and losses that are

likely to become available. Any one who doubts this has only to consider the other possible means of approximation. Surely, it is only the very naive and inexperienced who would wish to argue that direct questioning or voting should be employed to derive such approximations or that the whole economic problem should be turned over to a set of elected or hereditary guardians who would evaluate outputs by reference to their own ideas, or guesses, regarding the general welfare. The first of these plans is evidently an administrative monstrosity. We have had some partial experience with the second plan in connection with governmental financing of local air services, waterway improvements, and the like, where those few who benefit are organized and articulate while the many who bear the cost are scarcely represented at all. In the distribution of benefits and costs these programs are far more typical of output decisions in general than are the more broadly beneficial expenditures such as those for defense where there is moreover a relatively well-defined general objective in the light of which special claims can be evaluated. And even here, the very imperfect correlation between the political effectiveness of interested groups and the real incidence of benefits and costs raises serious problems.

The actually available market data leave much to be desired as will be realized upon comparing them with the ideal measures specified by the welfare economist. First of all, the revenues obtainable by typical actual sellers are not those which would accrue to a perfectly discriminating monopolist, but something less; and the expenses of actual sellers are in many instances higher than those which would be incurred with perfect discrimination among factor units. In addition, actual revenues and costs in

¹² As Dr. Graaff points out, in order to assure that the losses occasioned by the withdrawal of factors from other lines of production are adequately reflected in the added costs of the expanded output, it is *not* sufficient that the (strictly-interpreted) marginal conditions be satisfied in these other lines of production. This is so because the absence of surplus at the margin does not imply that any finite reduction of output can be made without loss of surplus. "One occasionally meets in the literature a suggestion to the effect that there is no need to worry about this loss of surplus if the factors are perfectly divisible and withdrawn from the margins of their alternative employments. Perhaps it is worth pointing out that finite quantities of factors (such as are needed to build a bridge) can never be drawn from a finite number of margins. A finite sum of infinitesimal quantities is still an infinitesimal." Graaff, *op. cit.*, p. 113 n.

¹³ For example, all those lines of investment where the general benefit is not adequately reflected in individually determined demands: defense, education, police and fire prevention services, etc.

any market are often distorted by artificial restrictions on supply and demand in this and in related markets. Thirdly, certain corrective government programs which would be needed to make actual market data correspond to actual benefits and costs may not have been put into effect. (These corrective actions are discussed more fully in Section III, below.)

Yet in the absence of better data, the important decisions of regulatory policy—pricing principles, to take a most notable instance—must in practice be based on the presumption that actual revenue and cost figures represent the best available approximations of relevant gains and losses. For example, in judging the desirability of putting a floor under (say) rail rates for the purpose of diverting traffic to (say) water carriers we must measure the relative values of the services of each carrier by the actual maximum revenue which can be extracted from shippers rather than attempt in each case to appraise the probable results *if* perfect discrimination, unrestricted consumer and factor choice, and ideal regulation existed throughout the economy; and a similar observation applies with regard to relative cost.¹⁴ On the basis of this presumption, a general economic case can be made (1) against redistribution of business in accordance with restrictive or protective aims, and (2) in favor of direct subsidy rather than regulatory protection as a means of governmental "promotion" of a particular product or firm. If indeed the whole truth were somehow known, the benevolent (if somewhat devious) guardian might find it desirable to institute a widespread network of restrictive devices—rate floors and ceilings, licensing

requirements, etc.—to compensate for the uneven incidence of pricing defects, restrictions, and regulatory failings throughout the economy.

Since this revelation of the whole truth is to say the least unlikely to occur, the proper course of action would seem to be to accept the data that are available as the best objective indicators of gains and losses, and *meanwhile to do whatever is possible to improve them*. This means that a proposed output increase is to be judged desirable wherever actual added revenues available from its sale exceed the actual added cost which it occasions—that is, the substitution of a "self-financing" test for the "increase of surplus" test in deciding on an output change; and that at the same time action is to be taken along at least three lines to improve the accuracy of the available market measures: (1) the correction of pricing imperfections by private and public action; (2) governmental action to eradicate private (as well as public) restrictive practices; and (3) government measures, either fiscal or regulatory, designed to bring market data into line with total costs and benefits where there is some special cause of divergence which can be corrected by these measures.

Under heading (1) would be included all pricing improvements which would tend to bring the "self-financing" test into conformity with the "increase of surplus" test by removing the distorting effects of uniform pricing. For any given demand and supply situation, any output increment which could pass the "self-financing" test would also pass the "increase of surplus" test but the converse is not true. The discrepancy in the tests becomes important *first* wherever the average added cost of a given output is higher than the average added revenue which can actually be earned but not higher than the average added revenue which could be

¹⁴ Application of this presumption as to market data in the development of regulatory policy is illustrated in L. S. Keyes, "The Protective Functions of Commission Regulation," *American Economic Review*, May 1958.

earned with perfect discrimination. For example, in the familiar case of the single-price monopoly the expansion of output beyond the point where marginal revenue is equal to marginal cost does not, because of the necessity for uniform pricing, yield added revenue in excess of added cost even though surplus is thereby increased. Another familiar instance is the case of the new plant, machine, or product which could yield revenues sufficient to cover costs only with a degree of price discrimination which does not appear feasible. Less familiar but nevertheless apparently of substantial quantitative effect, is the lumping under a uniform price of various outputs whose cost and demand conditions are significantly different, a practice which may result in internal subsidization and consequent misallocation of resources.¹⁵ *Second*, the discrepancy is important where the added cost of an output is affected by lack of perfect discrimination in the factor market. This pricing imperfection not only causes improper valuation of factor units in cases of monopsony, as has been indicated, but also appears to have a generally distorting effect on resource utilization even in the case of pure competition, where it does not prevent the attainment of the output at which price equals marginal cost. This point will be taken up later.¹⁶ In addition, it may be noted that the inability to hold factor prices down to transfer costs can seriously hinder and in some instances nullify the effectiveness of price regula-

tion in bringing actual monopoly output nearer to the optimum level.

It has no doubt occurred to the reader that the same pricing conditions which produce a discrepancy between the results of the two tests also insure that the process of profit-maximization does not maximize surplus. With a qualification stated hereinafter, if all products were sold by perfectly discriminating monopolists the welfare optimum would be equivalent to a profit-maximizing equilibrium and any measure which brings about better pricing in one of the "discrepancy" situations named above will also bring actual output closer to the welfare ideal.¹⁷ In these situations, price discrimination seems preferable to uniform pricing even if we take into account the *prima facie* case against discrimination which can be derived from welfare economics. As applied to discrimination among buyers the argument runs as follows: For an optimum distribution of product among buyers, every buyer must have the same marginal rate of substitution of money for the product; otherwise, a net welfare gain could be made by selling more to the buyers with high marginal rates of substitution, and less to those with low rates. (The former could fully compensate the latter for the loss of the product, and still be better off.) Since each buyer is supposed to increase

¹⁵ The problem is *not* one of setting price equal to marginal cost, in the usual sense of that term, nor is it an exercise in "cost allocation," as that phrase is generally used. In considering the advisability of an investment which will form a part of the cost of producing more than one unit of output, any "allocation" of this expense among these units is acceptable, provided it is consonant with the realities of demand.

¹⁶ The special conditions under which there will be no rent from the point of view of the industry at equilibrium are summarized in L. S. Keyes, *Federal Control of Entry into Air Transportation* (Cambridge, Massachusetts: Harvard University Press, 1951), pp. 30-31.

¹⁷ "It is obviously wasteful, from the point of view of society, if any commodity fails to be produced up to the point where its marginal utility (shown by its demand price) is equal to its marginal cost. But under simple monopoly marginal revenue is equal to marginal cost; monopoly output is therefore undesirably small. From one point of view, therefore, price discrimination must be held to be superior to simple monopoly in all those cases in which it leads to an increase of output, and, as we have seen, these cases are likely to be the more common. But against this advantage must be set the fact that price discrimination leads to a maldistribution of resources as between different uses . . ." Joan Robinson, *The Economics of Imperfect Competition* (London, England: Macmillan and Co., 1938), p. 206. The disadvantage mentioned in the last sentence is that on which the *prima facie* "welfare" case against price discrimination is based. This case is discussed here in subsequent paragraphs.

his purchase of each product to the point where its price is just equal to his marginal rate of substitution of money for the product the optimum condition requires that every buyer be charged the same price.

The argument evidently depends on the assumption that the buyer with the higher marginal rate of substitution of money for the product both would and could buy more of the product if prices were uniform. This assumption does not hold when no output would be forthcoming without discrimination; it does not hold when discrimination is perfect; and it does not hold when discrimination (as is at least sometimes true in transportation) merely transfers to the seller the "surpluses" otherwise available to separate classes of buyer with "discontinuous" or limited demands—who would not in any case have equated marginal rate of substitution to price. In general, the assumption does not hold where every one's quantity of purchase is at least as great under discrimination as it would be with uniform prices. Where this condition is not fulfilled the case is perhaps not quite so clear-cut. However, it is possible to show that, wherever profitable discrimination results in a larger total output (and this is generally true as compared with single-price monopoly), a calculation of its benefits and costs in terms of actual market data results necessarily in a net gain provided no buyer pays less than the added cost attributable to him; and this despite any incidental harm to buyers who may obtain less output.¹⁸

¹⁸ Since the maximum added revenue (minus added cost) obtainable from these buyers for this lost output must be no more than that obtainable from other buyers for the same output, the gain to the latter exceeds the cost of service by at least as much as did the foregone gain of the former. Moreover, the added output produces a net gain because actual receipts from its sale exceed its added cost. In a strict welfare economics analysis, the gain from the added output must be offset against the possible "maldistribution" of

Though we may and probably must rely for the most part on the profit-maximizers themselves for the development of pricing systems better adapted to the maximization of surplus, there are some governmental policies which can contribute to pricing improvements. First of all, government can refrain from placing unnecessary obstacles in the way of desirable private action. In the case of the firm which is not earning excess returns there is a very strong case for permitting differential pricing to continue unimpeded. For here we may safely assume that whatever price system exists is necessary for the profitable conduct of the enterprise. Since enforcing a uniform pricing rule would undoubtedly reduce profits (otherwise there would have been no motive for discrimination) and profits are (ex hypothesi) no more than normal, there is here a strong presumption that the case is one where discrimination benefits all concerned.¹⁹ In other cases of unregulated monopoly we may be fairly sure that output is brought nearer to the optimum by discrimination and that a net gain is brought about despite the possibility of some losses. Again, in the commission regulation of relative pricing, or price structure, the benefits of lowered average costs and increased output which can in many cases be achieved by a discriminatory price system should not be sacrificed for the sake of a fetish of uniformity.

Secondly, there are some positive governmental actions which may directly improve the price system. The "public-utility" sort of price control which is aimed at the elimination of excess returns

product when discrimination is not perfect (i.e., the unequal marginal rates of substitution of money for the product, discussed in the text.)

¹⁹ This is the position tacitly adopted in our present regulation of discrimination under the antitrust laws. The law is concerned with price relationships only where (among other things) certain adverse effects on competition are involved.

(i.e. average price equal to average cost) seems to be a valuable regulatory tool from at least two points of view. (It does not, of course, imply *uniform* pricing except where output is at a low point on the cost curve where marginal cost is equal to average cost; here the general requirement that no one pay less than marginal cost, coupled with the absence of excess profits, means a uniform price equal to both marginal and average cost.) First, price regulation of this type, coupled if need be with direct elimination (through government action) of contractualized monopoly rents, could be a means of approaching optimum output in decreasing cost situations where pricing could not be perfected. The resulting output level—which would be the nearest to the welfare optimum consistent with the requirement that all investment or cost increments shall to the maximum extent possible be subjected to a continuous market test of their ability to finance themselves—we might call the “self-financing optimum.”²⁰

More than this, however, something similar to this sort of regulation seems to be necessary for the achievement of the welfare optimum even if prices are everywhere perfectly discriminatory. For consider again the situation where all outputs are produced by perfectly discriminating monopolists. Everywhere rents are being earned which are equal to the difference between discriminatory revenue and discriminatory expense. Now if profits were redistributed to consumers so as to leave equilibrium output (immediately) undisturbed but bring average *net price*—i.e. price paid minus the *rebate per unit bought*—down to average cost, more income would be available for expenditure at the margins of production,

or for financing new products not otherwise feasible. Resources would be attracted from idleness; real income would be made larger. Thus without this sort of *regulation* it would seem that the situation would not conform to the basic requirement for an optimum: that no reorganization be possible which could leave everyone better off than before. A similar argument would seem to apply to the intramarginal “rents” which may be earned under pure competition. A new sort of control would have to be devised to return these “rents” to consumers without altering price.

III. Necessary Legal Limits

Divergences between private and social gains or losses from various types of economic activity have been discussed at length by welfare economists, particularly under the title of external economies and diseconomies of production.²¹ It is commonly suggested in this connection that these divergences be corrected by a system of taxes and bounties levied or paid by the government. This analysis also indicates a proper corrective role for economic regulation—that is, as a substitute for the suggested fiscal type of action in those apparently many instances where a straight prohibition is as good as a tax in bringing about the desired result. The use of regulation is surely appropriate wherever it seems reasonably certain that an adequate reflection of the social cost involved would result in a tax so heavy that it would be less costly to the producer to adopt preventive measures: for example, when the smoke nuisance attributable to a given firm is demonstrably more costly to the community than the installation of smoke-preventing devices would be to the manufacturer. A second relevant example

²⁰ This optimum differs from the “unconditional optimum” described in the book cited in note 16 above. The latter optimum concept was based on the acceptance of uniform pricing as an unalterable datum.

²¹ These discussions are ably dealt with in W. J. Baumol, *Welfare Economics and the Theory of the State* (New York, New York: Longmans, Green and Co., 1952).

here is the licensing requirement in the radio and television industries, where it seems hardly worth while to attempt to measure the "social costs" of interference. Such regulations, which bring about a closer correspondence between market data and total benefits and losses, of course tend to bring the actual operation of the economic system closer to the welfare optimum and to minimize the error involved in using actual market data as bases for policy.

Similar types of regulation can be justified as means of bringing about a speedier adjustment of actual market demand to conformity with the enlightened judgment of experienced consumers. Thus, instead of waiting for consumer trial and error to eliminate the unsafe airline operation or the harmful medicine, the law may rule out these products as being highly unlikely to survive in the long run. Proscription of false advertising and grade labelling requirements may be similarly justified.

As a general rule, regulations of this type, despite the fact that they are prohibitive in form, do not entail objectionable restrictions on the demand for or supply of any good. They facilitate rather than impede the adjustment of factors in accordance with consumer preference. However, some regulatory devices, as a matter of physical necessity, do involve the creation of possible temporary restrictive effects. A notable example is the licensing of broadcasting stations already mentioned, which prevents interference but can do this only by at the same time giving certain selected companies a protected market status for periods of several years.²² Similar problems arise in connection with the antitrust regulation of certain private

business practices, e.g., the long-term supply contract which is necessary to achieve certain economies or product improvements but can do this only by giving a certain supplier a protected status vis-a-vis his competitors. Both types of problem must be dealt with in the light of concrete experience. It is not possible to predict a priori the effects of a particular "indeterminate restriction" of this type. Apparently the only way to deal with them is to attempt the formulation of ad hoc rules based on similar experience in the past. Though the lessons of experience may be very difficult to interpret they seem to be the only possible means of arriving at any estimate of the probable net balance of benefits and costs.

IV. *The Price-Equals-Marginal-Cost Rule and Pure Competition*

The justification for and applicability of the rule of equality of price and marginal cost has been debated at great length for a number of years.²³ The present discussion will merely indicate the relation of the famous rule to the argument and proposals outlined in Section II.

The meaning of the rule, which is derived directly from the marginal equivalences of the welfare optimum, is by no means the same for all writers. Some writers cite the authority of the rule to back up their insistence that each buyer be charged only as much as is necessary to cover the costs which could be avoided if his demand alone were not met. In this narrow form, as a little reflection will show, the application of this principle would mean abandoning the use of market data as guides for almost all investment decisions and for this reason seems obviously objectionable.

²² An interesting discussion of certain related conflicts of regulatory aims is contained in Professor Harvey J. Levin's recent article, "Broadcast Regulation and Intermedium Competition," *Virginia Law Review*, November 1959.

²³ See Little, *op. cit.*, Chapter XI, and the references cited therein.

The precise fulfillment of the welfare optimum does require that output of each good be expanded to a point where the price obtainable for the final unit is equal to the cost which could be avoided if it were not produced but this is by no means a sufficient condition for the achievement of ideal output. In short,²⁴ the fulfillment of the other (and quantitatively far more important) necessary conditions for optimum output requires market information which can be obtained only by pricing that is not strait-jacketed by the "narrow" marginal cost rule. These necessary conditions include the requirement that the outputs made possible by each investment "lump" be able to bring in (in the strict welfare analysis, be able to bring in with perfect discrimination) revenue sufficient to cover their cost (strictly, their cost under perfect discrimination among factor units). In my opinion, it is the lack of proper guidance for investment rather than technical difficulties of subsidization for decreasing-cost firms which weighs most heavily against marginal cost pricing as a practical expedient.²⁵

On the other hand, if "marginal cost" is broadly interpreted to mean a flexible concept of "added cost," and "price" also broadly interpreted to mean "added revenue," and "equals" is interpreted to mean "equal to or greater than,"²⁶ and

suitable allowances are made for imperfections in pricing, then the price equals marginal cost rule corresponds to an acceptable and practical optimum concept.

Because every firm in the pure-competition industry maximizes profit at an output where price equals marginal cost from the point of view of the firm it is often argued that the welfare optimum must necessarily be reached under conditions of universal pure competition. But, leaving aside restrictions and the so-called real external economies and diseconomies—which may occur in any sort of market and cannot be dealt with by pricing improvements—it remains true that a discrepancy between the welfare optimum and the competitive equilibrium can occur simply as a result of defects in factor pricing, as has been shown above. This discrepancy is reflected in a difference between marginal cost to the firm and marginal cost to the industry and can be corrected only by centralized purchasing or some other new form of control.²⁷

them by the general inequalities which must be satisfied, it would be obvious that the optimum position must satisfy a different maximum condition (inequality) for every alternative which can be contemplated. Thus, it must not pay to make a small step forward or backward, a middling step, a sizable step, a huge step, to shut down completely or open new line, etc., etc. Each of these implies a relationship between price or revenue and entirely different measures of marginal or differential cost."

²⁴ On this point, see Keyes, *Federal Control of Entry into Air Transportation*, Appendix.

²⁵ In the above-cited "Comment," Professor Samuelson deplores the "skepticism and calumny" evoked by the marginal equivalences, but goes on to suggest (p. 38 n.): "Part of this distrust stems from the correct feeling that it may not be feasible to price all goods at marginal costs with losses financed out of optimal lump-sum taxes; or that with many of the necessary optimum conditions violated, it is not ideal to have any particular subset of them alone satisfied. These considerations suggest that, instead of throwing out the baby with the bathwater, we solve the theoretical problem of the 'feasible optimum' and deduce the relevant policy considerations."

²⁶ A broad interpretation of marginal cost is adopted by Professor Samuelson in his *Foundations of Economic Analysis* (pp. 241-243): "Marginal cost is the difference between [total] costs in two situations If one dropped the first order statement of optimum conditions and replaced

²⁷ Professor Samuelson apparently prefers to call this discrepancy the result of a "natural scarcity," because he believes that no remedy can be found for it. "As long as the Good Lord made only a limited amount of fertile Iowa farm land, it will earn a rent for its owner—regardless of how he originally acquired title to the land. *Competitively determined rents are the results of a natural scarcity.*" Samuelson, *Economics: An Introductory Analysis* (New York, New York: McGraw-Hill, 1958), p. 603; and, *ibid.*, p. 604: "By definition, natural scarcities are such that nothing can be done about them. But under imperfect competition, we encounter in addition so-called *contrived scarcities*." It may be noted, however, that the Creator presumably did not decree that returns from scarce factors be uncontrolled. Indeed, Professor Samuelson seems somewhat at a loss as to what to do about *imperfect competition* (see p. 487 n.), at least in some cases. Does this mean that sometimes imperfect competition exemplifies "natural" rather than "contrived" scarcity? Perhaps a scarcity of demand, rather than supply?

The non-ideality (in the indicated sense) of pure competition is of course not the only, nor yet the best, reason for refusing to adopt universal pure competition as a goal for public policy. As the above discussion has shown, this sort of market organization is no more necessary than it is sufficient for optimum economic performance. Furthermore, it seems to be typical of the markets for most products that the efficient size of firm is large relative to total demand and any attempt to atomize production would therefore result in the disappearance of a large number of products and the production of others at a much higher cost.

No such quixotic policy aim is necessary to provide a satisfactory rationale for antitrust and for other types of procompetitive regulation. In brief, the objective of this sort of regulation should be the elimination of private restrictions—an objective which is easy to justify on economic grounds and readily elaborated to cover such problems as price discrimi-

nation and mergers to which its relevance is not generally recognized. The rationale for a policy of antirestrictionism lies in its obvious relation to the improvement of market data as measures of benefits and costs and consequently to the improvement of actual economic performance. A demand which is artificially expanded by restrictions on the supply of a substitute cannot, for example, be expected to reflect properly the prospective purchasers' evaluation of this product as compared with its restricted competitor. The problem is essentially the same as that of governmental restriction and, as has been noted, raises similar difficulties when physical necessity links cost saving or product improvement with temporary limitations on freedom of choice. As I have argued elsewhere,²⁸ a policy of antirestrictionism is an appropriate supplement to price control in some instances as well as being a proper general aim of regulation.

²⁸ In the paper cited in note 14, for example.

Filtering and Housing Standards: A Conceptual Analysis

By IRA S. LOWRY*

FOR some years, discussions of public policy in the field of urban housing have been haunted by an argument which may be briefly summarized as follows: A general improvement in housing standards can be achieved within the framework of the private housing market by a process described as "filtering." Direct government programs which provide subsidized new housing for lower- or middle-income families interfere with an orderly market process that would otherwise provide second-hand—but socially adequate—housing for these same families at prices within their means.

The proponents of the filtering method of raising housing standards seem to agree that the provision of "decent, safe, and sanitary housing" for all members of the community is a legitimate concern of public policy; they also seem to accept current definitions of minimum standards. The issue is rather the efficacy of alternative means for achieving an accepted goal. We are not faced with a knotty problem in welfare economics but with a clear-cut problem of the behavior of the market mechanism in a particular and somewhat peculiar setting.

My intention, therefore, is to scrutinize the model of housing market behavior presented by the partisans of filtering. Since they have never put anything in writing (so far as I can discover), I run the danger of dissecting a straw man. If this is in fact the case I may at least hope to provoke an enlightening rejoinder.

Because the analysis of filtering is largely an oral tradition the meaning of

the concept itself is fuzzy. I am familiar with only four publications which deal with the subject at any length.¹ None provides a satisfactory conceptual framework for dealing with the policy issue around which the argument revolves. Professor Ratcliff's definition of the filtering concept is a neat case of implicit theorizing; he describes filtering down as "the changing of occupancy as the housing that is occupied by one income group becomes available to the next lower income group as a result of decline in market price, i.e., in sales price or rent value."² Though his discussion of the hypothesis *ex definitione* contains many trenchant observations, it does not really grapple with the argument of the partisans of filtering as I have presented it above. Fisher, Winnick, and Grebler are precise in their use of the term but define it so as to deprive it of most of its analytical usefulness in the present context: "Filtering . . . is a change over time in the position of a given dwelling unit within the distribution of housing rents and prices in the community as a whole."³ Rodwin is never clear whether

¹ Richard U. Ratcliff, *Urban Land Economics* (New York: McGraw-Hill, 1949), pp. 321-34, and E. M. Fisher and Louis Winnick, "A Reformulation of the Filtering Concept," *Journal of Social Issues*, 1951, pp. 47-58 are analytical in approach; the Fisher and Winnick article draws heavily on Leo Grebler's *Housing Market Behavior in a Declining Area* (New York: Columbia University Press, 1952), which is an empirical study of "filtering." Lloyd Rodwin also reports on filtering in, "The Paradox of Boston's Middle Income Housing Progress," *Appraisal Journal*, January 1951, pp. 42-55.

² *Op. cit.*, pp. 321-22.

³ Fisher and Winnick, *op. cit.*, p. 52. The advantage claimed for this definition is the ease with which filtering can be measured when the problem of price deflation is evaded. About the only clear use for such a measure is in the analysis of differential rates of value depreciation for housing in different neighborhoods of the urban area under consideration. Even so, its interpretation under conditions of changing population and new construction becomes rather ambiguous.

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filtering is something that people do, or something that houses do.

For the purposes of the analysis to follow, I propose to define "filtering" simply as *a change in the real value (price in constant dollars) of an existing dwelling unit*. This definition has the advantage of clarity and simplicity. It has an empirical correlate which is at least theoretically quantifiable although it does not avoid the index number problem. (Any analysis relevant to the policy question posed above *must* face this difficulty.) Finally, the definition contains a minimum of implicit theory—that is to say, it makes no attempt to stipulate the causes or consequences of filtering. By this definition the dwelling unit can filter up in value as well as down; occupancy may change as a consequence, or it may not; other units may be similarly affected, or not. These matters are not pre-judged.

To analyze filtering as a market process, its causes and consequences, four basic constructs should be kept in mind: (1) An array of all dwelling units according to their real values (prices in constant dollars). (2) An array of all dwelling units according to their quality (by some quantifiable measure other than price). (3) An array of all households according to their real incomes (incomes in constant dollars). (4) An array of supply prices of *new* dwelling units of each quality class (in constant dollars).

It may be noted that implicit in these constructs is also the magnitude of the total housing inventory and the total number of households. Concerning these constructs, we make the following assumptions: (1) There is a rank, but not necessarily cardinal, correlation of quality and value of each dwelling unit. (2) There is a rank, but not necessarily cardinal, correlation of tenant income and value of dwelling unit. We thus

suppress variations in taste and household size within income groups.

(3) As a first approximation, all dwelling units will be assumed to decline in quality with the passage of time, without respect to other variables in the system.

(4) As an analytic starting point, we will assume the market to be in equilibrium; that is, given the costs of new construction, consumer tastes and incomes and the number of households, all households have balanced their quality requirements with their incomes within the standing stock and there is at the moment no new construction.

The number of households, their real incomes and tastes, and the supply price of new construction are all variables which bear on housing standards. By means of conventional supply and demand analysis it can be demonstrated that changes in these variables will affect the price level and distribution of the standing stock of dwelling units, that such changes will cause filtering, whether up or down, of the entire inventory or some of its component parts. Furthermore, it can be shown that, frictions aside, filtering up must cease when the price of an existing unit of given quality exceeds the supply price of a new unit of that quality. Filtering down will cease when expected revenue no longer covers prime costs, in which case the dwelling unit has only scrap value. Within these limits, demand price rules the market.

However, the above variables are exogenous to the market process with which we are concerned. If the partisans of private housing base their argument on rising real incomes, and on falling supply prices of new dwellings, etc., as a premise for rising housing standards, their disagreement with the "doubters" is essentially trivial. For the filtering argument to have force and content, it must be

based on endogenous changes in variables—the relationship between quality and value in abstraction from exogenous influences and, in particular, from those which are in no realistic sense subject to policy control insofar as they influence the housing market.

The partisans of filtering as a means of implementing housing policy have frequently drawn the analogy of the automobile market where upper-income households purchase new automobiles every year or two; their old autos enter the used car market, selling at a substantially lower price although they still have a good many years of useful life.

It is not altogether clear whether the argument is that the housing market is like the automobile market or that it *could become* like the automobile market. In either case we might trace the endogenous market process which this analogy suggests: Since quality declines with age, the demand of those households with the highest quality-preferences cannot be satisfied by even the best of the standing stock for very long. Therefore resort to new construction is necessary for such households to maintain their quality standards. Furthermore, the supply price of new construction in this quality class is at least proximate to the prices of existing structures.

When such households decide in favor of new construction the dwellings vacated by them form a price-depressing surplus which causes a filtering-down of all units in the inventory and a subsequent shift in occupancy as prices decline so that the income distribution shifts upward relative to the quality scale. At the bottom of the quality scale will be the residual of surplus housing, now unoccupied. It is thus conceived that the price decline of the entire inventory has its source in the quality decline of new units in the early portions of their lives.

Simultaneously—and independently of the filtering process—there is a gradual general deterioration of quality over time so that each unit moves lower on the quality scale. The effectiveness of filtering as a means of raising housing standards thus hinges on the speed of value-decline relative to quality-decline. If the value of the standing stock depreciates so rapidly that even low-income households can afford⁴ units which are still above the quality standards of social adequacy, the private market is a satisfactory instrument of public policy.

The above constitutes the filtering argument as it has been presented to the present writer. As we suggested earlier, it is not always clear whether the model is meant to represent actuality or possibility. Moreover, contestants on both sides frequently shift to the ambiguous grounds of changes in the exogenous variables of household population or real incomes, etc. My concern, however, is only with the process of quality decline and its relationship to value.

It will be recalled that for the purposes of the above model we assumed that quality decline is a pure function of time—that is to say, that it is “caused” by forces irrelevant to our analysis which operate regularly over time. Let us consider this further. What is actually involved in quality decline?

In the automobile market we can immediately name design or style obsolescence as a (perhaps *the*) major factor in quality decline. Identifiable newness *per se* is a very desirable attribute in an automobile and it is evident mostly in body styling. Much less significant would

⁴ Strictly speaking, what the low-income household can “afford” is a metaphysical question. As a matter of practical politics, however, we can make reasonably accurate estimates of what such a household would be willing to pay; and if necessary, public policy may be implemented by limiting the household's choice to socially adequate housing—given its availability—through the police power.

be technological obsolescence in the sense of innovation which contributes to the measurable efficiency of operation, so that a car embodying the innovation would be preferable to an equally new car which did not. Finally, there is a physical deterioration—the actual wearing out of the machine due to use and the elements. All three of these elements of quality decline also appear to operate in the housing market as influences on price although the relative magnitudes of their influences are more problematical.

Style obsolescence as a production policy appears to have been borrowed by the automobile industry from the women's clothing industry and has recently spread to the appliance industry. In house building there are clearly defined fads in architectural style which differ from those of the automobile industry (but not from women's fashions) in that they frequently evoke past styles. Moreover, identifiable newness per se does not seem to be so desirable a quality; people tend to be apologetic about the raw look of very new houses. Concomitantly, identifiable age, particularly antiquity, is not per se derogatory. While it seems unlikely that style obsolescence is very influential in the decision of home owners to change residence, it is almost certainly a consideration to renters who are considering a move to other rental quarters or the purchase of a home.

The question of technological obsolescence has considerably more importance. There have been significant changes in the lifetime of most of our housing inventory, in heating and lighting systems, plumbing, the arrangement of rooms and the efficient utilization of space, general coordination with and provision for modern appliances and modes of family life. Some of this obsolescence is intrinsic in the structure or layout of the building; a substantial

portion can be overcome at reasonably low cost within the framework of the existing structure—e.g., installation of floor furnaces, or 220-volt wiring for electrical appliances.

Physical deterioration has always an ambiguous meaning and strikingly so in the case of housing. The roof may sag, dry rot may undermine the foundations, the building may settle. These are difficulties not easily remedied and involve a real decline in structural quality. Deterioration of this type is either implicit in the structure from the beginning as an incident of fraud or miscalculation or it is the inevitable or unpredictable consequence of the passage of time.

But the greater part of the category of physical deterioration seems to consist of those minor incidents of wear and tear and of the elements which, summed together, form a fairly regular and substantial component of annual housing costs: flaking paint, broken windows, cracked or warped siding, leaky roofs, clogged plumbing or drains, worn-out screens, scuffed floors or linoleum, etc. The point is that with adequate maintenance a house need not depreciate in these respects. Of course, the *reductio ad absurdum* of the notion of maintenance would be the demolition of the existing structure and the erection of a similar one on the site. But there seems to be a significant portion of the physical inputs of a dwelling unit which evidence little or no deterioration over time, of which the most obvious is masonry. The surprising age of many well-kept houses is evidence for the proposition that a periodic outlay which is small in relation to the total value of the unit will usually preserve it in close to its original condition.

It might also be noted that much of what has been termed technological obsolescence can be overcome in the

course of normal maintenance. For example, when a furnace or water-heater wears out, it is generally cheaper to replace it with an up-to-date one. The same is true of bathroom and kitchen fixtures.

We may reasonably suppose that all three elements of quality decline affect the demand price for a dwelling unit. However, from the point of view of public policy, quality decline includes only the latter two. A house does not fall below the standards of social adequacy by reason of style obsolescence. It may do so because of technological obsolescence but the current standards of social adequacy are so minimal that the impact of this type of quality decline is greatly reduced. Physical deterioration is probably the most important factor of the three in the emergence of substandard housing.⁵ This distinction lends plausibility to the filtering argument in that it suggests a slower decline of "social quality" than of "market quality." The magnitude of this difference cannot be defined within the limits of an analytic model.

Let us consider once more the filtering model developed above. In abstraction from changes in income, population, etc., a decline in the market value of recently-built houses must hinge on quality decline—and it is reasonable to suppose that this quality decline takes the form of style or technological obsolescence rather than significant physical deterioration. As top-bracket occupants periodically insist on *new* housing their former dwell-

ings enter the used-house market. Because the supply (standing stock) in the second quality bracket is now increased relative to the demand (number of households) the prices of all dwelling units in this quality bracket will fall, whether there is any further quality decline or not. This price decline would continue until some of the occupants of the third quality stratum took advantage of the low market to improve their housing standards. Thus value depreciation would be propagated throughout the entire inventory.

Suppose we view this value decline from the point of view of a landlord. Abstracting from the other elements of quality decline, we will assume that with "normal" maintenance the quality of the dwelling unit could be preserved indefinitely.⁶ But if the demand price (say, annual rent) falls below the landlord's total annual operating costs (without reference to the historical cost of the structure) his logical response is disinvestment, so that the current outlays may be applied elsewhere to yield a better return.

The landlord's expenses may be divided into (1) *user costs*, which would not

⁵ Other factors of considerable import for standards of social adequacy are (1) overcrowding, whether or not implemented by structural conversion and (2) "neighborhood deterioration." The former can be, in a sense, a consequence of value decline, as suggested later in this essay. If the latter is unrelated to the quality of the structure itself, such deterioration is either implicit in the socio-economic characteristics of the tenants or the result of the invasion of incompatible land uses. These are all matters of theoretical interest but independent of the point which I wish to develop as to the internal behavior of the market.

⁶ This assumption may appear contradictory to the earlier one that the depreciation of *new* houses is outside the scope of the maintenance problem, being due rather to style and technological obsolescence. There is an element of paradox here; but it should be possible for the major factors in "market quality" depreciation to alter over the life of a durable good, particularly a prestige good. And if maintenance could entirely prevent the quality decline of *new* houses there would be no grounds for the initial value decline on which the filtering model is premised. I might take this opportunity to express some reservations as to the role of structural characteristics in motivating upper-income movements; it seems likely to me that a goodly portion of such moves are predicated on changes in social status and the goal is not "better housing" but a "better neighborhood" in the sense of one commensurate with the new status. This can often be achieved only by new construction in peripheral areas. But we are not here concerned with the effects on the housing market of rising status (e.g., rising income). The effect of this qualification and others made in the course of this essay is to raise the question, whether the filtering hypothesis, true or untrue, is of major significance in the context of rapid changes in population and income.

be incurred if the unit were vacant—e.g., heat and janitorial service—but excluding depreciation due to tenant-induced wear and tear; (2) *fixed costs*, which would be incurred whether or not the unit were vacant—e.g., taxes, insurance, administration—but also excluding any form of depreciation; and (3) *normal maintenance costs*, which would offset that part of depreciation due to physical deterioration and technological obsolescence (insofar as the latter can be controlled by maintenance).⁷ Graphically, using vertically additive curves, this is represented in Figure 1.

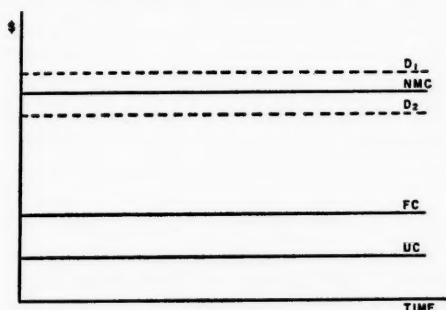


FIGURE 1

If the demand price falls from D_1 to D_2 , the landlord is faced with a perpetual loss. On the other hand, if he discontinues or decreases maintenance outlays, this will accelerate quality decline in the eyes of the market. We can build this consequence into the demand price by giving it a negative time-slope. This is represented by D_3 in Figure 2.

As a dubious concession to reality, we will also allow the tax and insurance components of fixed costs to decline as quality falls. Under these circumstances, the landlord will continue to rent so long as revenue covers what we

have defined as *user costs*. Until Time T_1 , his revenue will yield a surplus over current outlays, and at T_2 revenues will

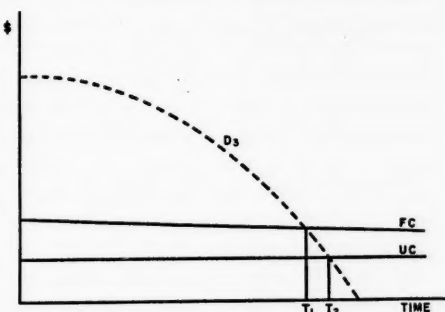


FIGURE 2

cease to contribute to *fixed costs* and he will board up the structure. If demolition will save *fixed costs*, he will follow this course between T_1 and T_2 .

Thus, undermaintenance is an eminently reasonable response of a landlord to a declining market. This argument is reinforced by the presumption that there will be a delay between the time at which normal maintenance ceases and that at which the consequent quality decline becomes obvious to the market. Furthermore, if all landlords follow the same course, the *relative* quality of dwelling units would remain more or less the same as the *absolute* quality declines. The consumers would not have the alternative of a better house at the same price; only a choice between housing and other goods. This would mean a lesser slope to the revenue curve D_3 than would be the case if our landlord's reaction were unique.

On the other hand, our model assumes that the landlord expects the lower demand price to obtain indefinitely. If he expects it to rise again, so that the house will once more be a paying proposition, his calculation will be whether the

⁷ The reader will note that we have defined these cost categories somewhat differently from the usual. If he prefers to attach other names to them it is of no consequence for the analysis.

costs of normal maintenance in the interim would be sufficiently less than the cost of renovation that the difference would cover the opportunity costs of the interim investment plus the uncertainty as to the eventual returns from the maintenance program. Some types of maintenance could be postponed for a considerable period without incurring extra cost.

The effect of a general policy of under-maintenance would be an accelerated decline in the quality of the housing inventory. But after a time the tenants of housing of the second quality stratum would find their dwellings deteriorating below their optimum quality levels and the competition for such better dwellings as remained would force prices up once more to the point at which maintenance costs were covered and the former quality level was maintained by adequate current outlays on the part of the landlords.

And so filtering would be halted in the successive value strata as the flow of units from above was shut off. Because of the phenomenon of under-maintenance, quality decline throughout the inventory would have been hastened in terms of physical deterioration, while the style and technical obsolescence of the units would be less, relative to price, than if the value-depreciation had not occurred.

This model has particular relevance to proposals for accelerated value-depreciation as a means of raising housing standards. If value-decline is the premise for under-maintenance and under-maintenance is an important element in quality decline (particularly "social quality"), the program seems to be in some measure self-defeating.

Would an owner-occupant respond differently from a landlord to value-depreciation? So far as his own dwelling is concerned, this change in market valuation takes the form of a decline in

imputed rent—a rather ghostly category. To be sure, there are now available on the market other units of superior quality whose price is equal to the historical cost of his own; but to make the change, he must take a "loss" on the sale or rental of his present home. If he stays where he is, he can maintain his customary quality level by means of his customary outlays, and it is hard to see why he should not do so.

For completeness, we may also consider the tenant. If our estimation of landlord reaction is correct, the tenant can maintain a given quality standard either by (1) offering a rent above the market in exchange for a maintenance guarantee—in which case no filtering would occur for that unit; (2) paying the market rent but moving frequently as houses pass out of his optimum quality stratum; and (3) entering the fee market. If he remains where he is, at a reduced rent, he will encounter a continuous decline in quality which may in turn be the premise for further rent reductions. But presuming that as quality declines the price elasticity of the consumer's quality demand decreases, the eventual shortage of better quality units will force the price back up and the tenant would find himself eventually in his former (equilibrium) position with regard to rent and quality.

Having so far developed the view of under-maintenance as a means of disinvestment, it seems worthwhile to call attention to certain other circumstances in which it may occur. These are not directly relevant to the "filtering argument" but are presented for what light they may cast on the general problem of blighted areas and slums.

Let us consider the owner of rental property on the fringe of the business district. We will suppose that the value of his land is rising (relative to the value of land elsewhere in the city) due to its in-

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creasing suitability for business uses. To continue the use of this property at its present intensity is to incur a rising opportunity cost. His alternatives are (1) to increase his rents concurrently with his rising opportunity cost, a possibility which is contingent on whatever influence the encroaching commercial area may have on the market evaluation of the property for residential uses; or (2) to disinvest by under-maintenance until the revenue stream falls below prime costs, then to demolish the structure.

The mechanics of the latter course may be shown by the use of a graph similar to those employed earlier (Figure 3). We

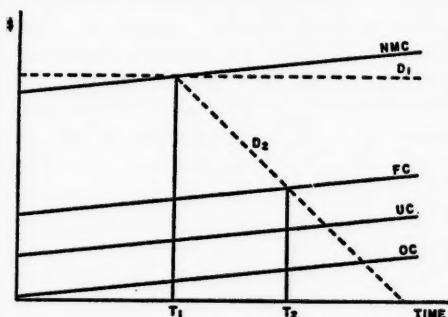


FIGURE 3

add a separate *opportunity cost* curve. Assuming that the demand price, D_1 , will not rise because of the encroaching business district, the dwelling unit ceases to yield a profit at T_1 , and maintenance will be reduced or discontinued. As quality declines, demand price follows the path D_2 , with demolition at approximately T_2 (since there is an alternative use for the land).

A third possibility which may occur to the landlord is an increase in the intensity of residential use through conversion into smaller units. We may assume that this would have been done even without the rising opportunity cost if the space demand in that quality bracket had been

such that this would have been a profitable course. But if, as a consequence of under-maintenance and the subsequent quality-decline, the dwelling unit falls into a lower price-class, the consumers in this market, having lower incomes, may also have a different pattern of space demand.

We have heretofore completely suppressed space requirements as a feature of housing markets, considering only quality. For the broad purposes of our argument this was a legitimate suppression. Nevertheless, it is clear that consumers economize on space as well as "quality per room." It is also reasonable to suppose that there is an "income effect" on space as well as quality. Consequently, in this new market the landlord may find that total revenue is greater from two four-room apartments (or worse) than from one eight-room house. Thus the rise in land values may be the premise not only for under-maintenance but for increasing density. In this way it has a dual impact on housing standards.

Finally, we may consider the case of the aging homeowner. Presuming that he is concerned only with maximizing household utility during his own lifetime, without reference to posterity, he is faced with the problematic advantage of owning a fixed asset whose value is unlikely to be consumed by the time of his death. His most "rational" course would be to sell the house and use the liquid capital realized as a means to a higher standard of living as a tenant in a dwelling of equal or superior quality. We must recognize, however, that the household differs from the firm in that the market evaluation of assets, to the firm, is the relevant one. To the household, market value is likely to be appreciably below his subjective evaluation of his dwelling, particularly when many of

his other assets—tangible and intangible—are especially adapted to the particular structure and location.⁸

This is the difficulty that economic analysis always faces in dealing with household decisions in the frame of reference of subjective utility. There is no "market" for many of the components of personal satisfaction so it is difficult to estimate the subjectively "economical" choice. The consequence is generally a turbid regression into assumptions about psychic cost.

We will confine ourselves, therefore, to pointing out the second in the rank of measurably "rational" decisions: disinvestment through under-maintenance. It seems a likely choice where the owner-occupant has reason to believe that the quality of his dwelling will not decline intolerably before his death.

It is apparent that our model of the housing market behaves in a way that was not envisaged by the advocates of filtering as a means of implementing housing policy. The price decline necessary to bring a dwelling unit within reach of an income group lower than that of the original tenants also results in a policy of under-maintenance. Rapid deterioration of the housing stock would be the cost to the community of rapid depreciation in the price of existing housing.

The divergence between this analysis and that which we have attributed to the partisans of filtering can be traced to a divergent treatment of the notion of quality decline. The partisans of filter-

ing have stressed the roles of style and technical obsolescence. It is their position that lower-income groups can jolly well put up with the inconvenience of outmoded style and awkward design—although there may be a public commitment to insure that these groups have "decent, safe, and sanitary dwellings."⁹

It hardly seems likely that many persons would dissent from this standard of social welfare—certainly not the present writer. But those who suggest that the standard can be attained by a policy designed to accelerate value depreciation or by the operation of the free market (in the absence of changes in construction costs or in real income) have overlooked the essential nature of physical deterioration and its relationship to maintenance: They have regarded the dwelling unit as an object which, once erected, is no longer subject to human influence. Quality decline related to style and technical obsolescence does not imply any change in the dwelling unit—only a change in human standards of evaluation. To be sure, this viewpoint does admit physical deterioration—but it is attributed to the relentless passage of time, not to human agency.

I have attempted to demonstrate that owners and tenants will respond to changes in the market evaluation of a dwelling unit with behavior which accelerates or delays the physical deterioration of the dwelling. If the two events are linked in this fashion, it is evident that a policy which implements price decline within the standing stock of housing cannot also nourish the hope of using this stock to raise housing standards.

⁹ This is the language of the George-Healey Act of 1936 (49 Statutes 115) which has reappeared in virtually all of the housing legislation of the federal government since that date.

⁸ The Federal Housing Administration has recognized this fact in its appraisal techniques. In capitalizing imputed rent of owner-occupied houses it included at one time an "amenity rent" component (*Underwriting Manual*, Washington, D. C.: United States Government Printing Office, 1938), Par. 1420; this was later abandoned in favor of a direct increase in the gross rent multiplier to allow for "owner-occupancy appeal" (*ibid.*, 1947, Par. 1215).

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An Explanation of Industrial Development in Underdeveloped Areas of the United States†

By MELVIN L. GREENHUT*

SCIENTIFIC developments have been so striking in recent years as to strain imagination. At the same time industrial capacity has been increasing, though probably at not as rapid a rate. This growth in the industrial base has nonetheless been clear, especially to those who reside in the underdeveloped areas of the United States. Unfortunately, our newspaper editors and industrial development personnel, our state legislators, laymen in general, and even some academic economists are all explaining (or suggesting) that this growth is rooted, as are our scientific advances, in the discovery of new techniques and relations.¹ They are advancing the thought that recently formed products and industry and old products and old industry, each subject to modern technocracy, are discovering fundamental factor advantages in underdeveloped areas which were not recognizable under the older

technocracy and that, accordingly, new plants are locating in these areas.

The present paper disputes the notion that the underdeveloped areas of the United States are growing because of national factor advantages that have just been realized. It is argued that only a small part of the improvement appears to be due to forces which make this kind of area nationally competitive; rather, most of the development, we assert, is simply the result of natural growth.² As evidence to support this view empirical data will be offered which, while only suggestive, are yet so strongly so that they should suffice to support the paper

¹John I. Griffin, *Industrial Location in the New York Area* (New York, New York: The City College Press, 1957), p. 94. "The larger and older cities . . . have developed a state of mind which may be called 'out-migration sickness.' Data have been published in newspapers and magazines pointing to the greater growth in the South, Southwest, and Pacific Coast." Significantly, as Griffin points out, it is relative not absolute growth that is at best involved. Also he notes that a good part of the movement is to the suburbs of large cities. Elsewhere, he suggests (page 8) that advantages of rural areas may in part be real economic advantages; however, he suggests that even where this condition holds true, it will dissipate in time as the areas in question develop. In effect, he appears to be considering relocations only and in this connection feels that a noticeable part of the cause for relocation is not the discovery of national economic advantages at different places than New York City but to no small extent is simply a matter of artificial inducements which attract industry up to a point.

And McLaughlin and S. Robock observed many years ago in, *Why Industry Moves South* (Kingsport, Tennessee: National Planning Association, 1949) p. 125 that . . . "it is significant that the new production represents in many instances a filling in of the local industrial structure." And later, they say: "This type of development actually repeats the economic history of the industrial Northeast."

L. Yaseen sees as a major reason for moving the shift in markets. Thus whereas a few years ago Detroit auto manufacturers shipped in all directions, now they scatter production over dozens of plants. See *Business Week*, July 24, 1954; also Neil P. Hurley, "The Automotive Industry: A Study in Industrial Location," *Land Economics*, February 1959, pp. 1-14. Mr. Hurley says: "With the establishment of new communities and new urban strips in the Pacific Northwest, the Old South, the Gulf Coast and the Pacific Coast, new markets will arise and prompt the auto industry to set up dealerships and regional assembly plants in the vicinity."

†The author acknowledges his appreciation to the Inter-University Committee for Economic Research of the South for a grant which led to the research which encouraged this paper. He wishes also to thank Marshall R. Colberg and Robert T. Collins for their comments and suggestions.

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¹For example, "Despite Tension, the South Keeps on Gaining," *Business Week*, October 26, 1957, p. 98ff; also "In the South: School Problems but Business Still Expands," *U. S. News and World Report*, February 20, 1959, pp. 52-55. More formally, Edward L. Ullman points out in his "Regional Development and the Geography of Concentration," (*Fourth Proceedings, Regional Science Association*, 1958, pp. 179-198) that " . . . it seems safe to say that a region in the commercial American economy cannot be expected to grow unless it has some ways of sharing in some aspects of the total national market or supply area—in other words, be nationally commercial or competitive. Something has to bring population into the area before local service can develop to serve it." In effect, a national economic advantage starts the growth of an area and then, in turn, a multiplying development may ensue. Clearly, this idea is not wrong in itself; what is wrong is the distortion that often ensues from carrying the idea too far. We will see this in the text via our explanation of the cause for recent development of certain regions in the United States.

or to stimulate further inquiry into what is taking place. Ultimately, it is believed, the hypothesis of natural growth and its related denial of the sudden discovery of long-prevailing advantages will be established.³

New plants are located because of many reasons. A new product may come into being which cannot be produced in the old plant of a company, or else an older plant may be uneconomically located for production of the new good. It may be that an expansion of demand signifies the need for additional facilities and that, rather than enlarge existing plants, entirely new ones with new machines are preferred.

Labor unrest and restrictive labor laws, high tax costs, inadequate capital (banking) support, insufficient raw material supplies and related considerations may foster the establishment of new plants. Shifts in demand, growth of regional and area demands, new price patterns, discovery of new raw material sources, new methods of technocracy and changes in established costs, such as modifications of freight rates, may all add up to new locations. The reasons for new plant location are myriad. On a priori grounds, which of those mentioned above may we expect to be the basic explanation of the increasing industrial activity in certain underdeveloped areas of the United States, say the South?

³B. Chinitz and R. Vernon, "Changing Forces in Industrial Location," *Harvard Business Review*, January-February 1960, pp. 126-136. They note this trend toward decentralization by claiming an increase in decentralization in 90 out of 119 industries studied. Moreover, these 70 industries accounted for 73% of the nation's manufacturing employment in 1954. They argue cleverly that the main force behind decentralization is not some long standing advantage which enables a firm to compete in national markets, but rather a *local advantage* which becomes clear because of new developments, such as the increasing use of trucks in transportation.

Southern (or Other Regional) Industrial Development: An A Priori Explanation

Location theory suggests that cost, demand, or purely personal factors govern plant site-selections. Let us dispense quickly with purely personal considerations, for patently these must be special to regional development and not too important. We then would have remaining a cost or demand basis of explanation. In turn, if we hypothesize a new location, it may be conceived of as the original plant location, as a branch location which is considered advantageous after comparison is made with the original plant of the firm, or as a branch plant location selected after comparison is made with a hypothetical branch plant conceived to be located in some alternative area of promising potential. For the purpose of this paper, we need stress only two main alternative conceptions into which our new plant location possibilities may fall.

(A) *Category I: National Market Effect.* A product may exist which is demanded more or less exclusively in a special area (e.g., New York City). The locator of the plant-to-be considers in this case a fixed or given market and tries to minimize his costs of selling to this point.

A variant of the above situation, at least in terms of locational effect, occurs when the freight cost on the finished product is relatively negligible and, as a consequence, an economic location anywhere in the nation may readily service all or most of the important areas of the country. Significantly in this variant situation, as with the initial instance, the site selected must be due either to some cost advantage or else to a price pattern which makes a particular place the industrial center. An alternative side of this case is a situation where freight costs

are not negligible but where one small area offers such other significant cost savings as to more than make up for any transport cost disadvantages it suffers with respect to possible alternative areas of location.

It is only in the case where nearness to selected buyers is of prime importance to sales that general location theory would cite the demand factor as *the* main location factor. And then, of course it would do this for either variant of Category I.

How much of Southern economic development falls into Category I? Possibly textiles (with their large labor cost saving), soil pipe (with labor, capital, raw materials advantages and so-called good-faith Robinson-Patman pricing) and a few other selected activities would warrant inclusion here.

(B) *Category II: Sectional Market Effect.* This category includes all cases where transport costs on the finished product are relatively high *and* demand is distributed over a wide area. Location of a plant is therefore made with respect to a particular market, not a general-national market.

The breaking up of a national market into many sub-markets is most characteristic of a large nation or, in many parts of the world, of a nation whose transportation facilities are not well developed. As a consequence, we find a set of seemingly contradictory forces underscoring the industrial development of a country such as the United States. To illustrate: During the early part of the nineteenth century the transport networks in the United States were crude and not well developed. They tended, as a result, to create many distinct transport areas. This condition would have encouraged industrial decentralization were it not for the high concentration of population east of the Mississippi. And at about the same time that the westward movement

was taking place, improvements in transportation were serving to sustain the older places of production. Industrial centers thus remained undisturbed in importance, for a while.

Lately, the increase in population (and unit household wealth), especially in the more sparsely settled areas, has apparently lacked full matching via improvement in large carrier transportation. Moreover, what transport developments have taken place appear centered in an increasing use of trucks which, because of their low terminal costs, decreases the comparative advantage of long-haul shipments.⁴ The effect is to magnify the number of particular markets that can be seen to constitute the national whole. In turn, this has led to the development of more than one center for a given kind of industrial process.

Alternative steel centers, use of assembly plants in the automobile industry, the spreading out of canneries, chemical operations and their like, are part and parcel of this developing scheme. The industrial development group in hitherto underdeveloped parts of the nation which does not boast of rising rates of industrial development is lost among the many that do.

We assert that much of the industrial development in underdeveloped areas, such as the South, is of this general type. We posit on a priori grounds that the South, for example, is not capturing much of the nation's industry which comes under Category I. There is *not* any extra-large number of unique advantages in this region which are suddenly capturing the fancy of erstwhile Northern industrialists. And, of course, this holds true of the southwest, the midwest, and the farwest.

We can expect, of course, that technological discoveries, fuller realization of

⁴Chinitz and Vernon, *ibid.*

economic advantages in selected places, changes in pricing techniques and their like will take place occasionally and when they do industrial shifts from old established centers to new ones will be encouraged. But this is at best an exceptional occurrence. More likely than not, the major new locations in this year and the next several years will be of the type which defers to normal economic growth in selected areas. The role of the industrial development expert is then not the attracting to a general area of that which otherwise would not have moved to that area, but rather the inducing of a plant destined for that general area to a particular place in that area.

Southern (or Other Regional) Industrial Development: Selected Statistics

How may one prove the assertions recorded above? To answer this question we suggest that an empirical survey of all new plant locations in underdeveloped areas be made. And we stress the need for this survey to comply with basic location theory for otherwise the findings would be a conglomeration of opinions expressed in individual languages and not subject to statistical summation.

Assuming such survey, it is next necessary to determine the location factors which would substantiate or refute the given hypothesis. One limited survey which we think is of this type was undertaken in part by the present writer. To detail its findings and to explain its theoretical system involves, however, a departure from present purposes and would entail an entirely new paper. Elsewhere, some findings and explanations have been recorded.⁶ Here we need

cite only certain "special matters" and statistics relating to this and other surveys. We begin with "special matters."

Surveys which are designed to explain why plants locate where they do uncover the condition of significant market growth in one or two ways. The respondent to a mail questionnaire (or the spokesman during an interview) advises of this condition when he designates access to markets as one of his main factors of location (i.e., his first, second, or third basic factor). Alternatively, he is noting a similar condition when he maintains that he was trying to minimize freight costs on raw materials or, better yet, on the finished product.⁶ Either one of these manifests the likely possibility that raw materials may be obtained from alternative sources and that production may take place in a plant (or plants) distantly located from the original subject plant and shipped to the particular market in question with advantage.⁷

We might grasp this idea easily by recalling an earlier proposal we made, namely, that we should consider a new location as being either that of the original plant of the company, or as a

⁶When a respondent checks freight costs on the raw material as the main location factor, we do not have conclusive evidence of the growth of a particular regional (or state) demand, certainly not as conclusive as is evidenced by its counterpart: minimizing freight costs on the finished product. For clearly a plant may be located at the only practical raw material center and then ship its output all over the world. It is, however, significant to note that this possibility may be ruled out in the Florida survey cited in footnote 5, both because of the generally small size of the plants that were located in the survey area and the frequency in which respondents checked freight costs on the finished product as well as on raw materials.

⁷Of course, there are still other ways to determine this condition, such as by checking to see whether the plant is an initial plant, a relocation of an old firm, or a branch plant. After this is found, a check on the market area of the firm becomes relevant. Unfortunately for this system, all too often firms that are oriented to a particular market will make selected sales to far off points. If the questionnaire is designed for many different kinds of information, as generally is required under contracts which support this type of survey and if follow-up inquiries are to be limited, then it often proves impractical, if not impossible, to use direct inquiry to determine all sides of the story.

⁸M. Greenhut and M. Colberg, *Why New Industry is Locating in Florida*, private report submitted to the Florida Development Commission. Also, M. Greenhut, "An Empirical Model and a Survey: New Plant Locations in Florida," *Review of Economics and Statistics*, November 1959, pp. 433-438; and M. Greenhut and F. Jackson, "New Plant Location in Florida and the Community," a paper presented at the Southern Economic Association in Atlanta, 1958.

branch plant of the company whose advantages and disadvantages are compared to that of the main plant, or a branch plant which was placed in a given market after various market areas were considered. This threefold division (especially the last two sets) defers to the alternative conceptions that generally serve as the basis for any answers given by respondents to a questionnaire on industrial location. This is to say, the individual who is asked to select whether access to markets, transport costs, labor costs, taxes, etc., served as his factor of location is able to respond only after he has set up a departure point against which the answer may be framed.

(1) We observed earlier that if an original plant is being planned and if freight costs are low, a vast market area exists and the location choice involves simple factors such as the need for proximity to selected buyers, or the desire to minimize freight costs, keep labor costs low, or their like. Local markets, we noted, are customarily of no import here. In fact, we further claimed that, in this kind of situation, one may well find an example of significant economic advantages at certain places. In contrast, if freight costs are high and determining of the location, then in fact a series of alternative market areas may be considered and our simple case really becomes the one described under paragraph (3) below.

(2) Where a branch plant is being established, the respondent is able to select his factors only after he has compared this plant with the main plant of his company. This setting up of a branch plant is frequently due to the development of distant markets and the agreement among company officials that their original plant is poorly located with respect to the "entire" market. Rather than scrap the original plant and start

anew, a branch plant might be established. This branch, for example, could yield vital savings in transport cost of the finished product, especially since the distance over which the finished goods are shipped will be reduced. Or else a new raw-material-supply point may be opened up which, by way of being closer to the branch plant than the local material supply point, saves the company vital costs in transporting the raw materials. Events of these particular kinds clearly point to the natural growth of markets as the reason for new location.

(3) It may, however, be that several alternative market areas have developed significantly, with one having outstripped the others. The locator who fills out a questionnaire with this situation in mind would tend to select access to markets as the main location factor. But even here the greatest advantage of the one area over the other may be in low labor cost, tax savings, or their like.

In cases where alternative market areas as well as a previously existing main plant exist, the plant locator may compare his branch both with respect to the original plant and the hypothetical plant considered for location in a different market area. Under this, for example, he might select markets or labor costs as the most important, depending upon whether he first compares the branch plant with the original plant or with the hypothetical branch. It is partly because of this that a factor designated as low as say the third in importance may in fact be as important for the location as one of higher rank. What controls the classification in this case is the perspective of the respondent, or, if the questionnaire includes specific instructions to cover this situation, that of the researcher.

It is possible that a new market area may have developed but that only one

raw material supply point (near to the main plant) is economic. Moreover, the cost of transporting raw materials may be greater than the cost of shipping the finished product. In such event, the branch plant would be subject to transport disadvantages and the basis for its construction would have to lie in some other factor, such as a market advantage in being near to selected buyers or a production cost advantage. Significantly, any such advantage would have to override the transport disadvantages, at least over certain portions of the market.

It is chiefly when freight costs on the finished product are low that a given place or section may develop as a production center. And then it will control the national market if some vital cost saving is obtainable at this center, such as in the cost of labor, the availability of capital, savings on transporting raw materials, or their like. But this does not mean that if a respondent checks only the production or procurement cost factors as having been instrumental in his plant location, we could not have had the location which actually was based on the natural growth of a local market. Rather, selection of such costs as *the* vital set of location factors is only a necessary—not a sufficient—condition for the national market (Category 1) situation. It follows then that we would be quite conservative if, in setting up our criterion we agree that the natural growth category will be accepted only where the respondent selects the market factor as vital or where, if he represents a small company, he checks transport costs on raw materials or, if not representing a small company, he checks transport costs on raw materials and on finished products. More simply and generally, would we not be conservative if we agree that for surveys of underdeveloped areas that are distantly situated from the economic

center of the United States, the selection of the market or transport factor will be classified as a natural growth situation? Would it not, at the same time, be under-emphasizing the explanatory power of our natural growth theory if we placed a location in the national market category whenever the market or transport factor *was not checked* as significant.

The reader will note that Tables I, II, and III are interpreted in this conservative fashion. And while our data are therefore limited to securing nothing more precise than a rough test of our claim that regional (or state) industrial development in the United States is not proving to be the result of the discovery of past mistakes or of substantial economic advantages, the data are stacked overwhelmingly in this direction.

We cite in Table I our own findings in Florida and, in Tables II and III, the findings of other researchers. We admit that additional studies conducted elsewhere in the country are needed to buttress our argument and we admit that a few special studies and sets of statistics such as presented here will not prove anything, but merely can suggest. Nonetheless, we assert because of these data or, if you prefer, on no other basis than a priori intuition, that many persons in this country are distorting the reasons for industrial development in the underdeveloped areas of the United States when they speak in terms of basic advantages.

The one survey⁸ (as noted in Table I) reveals that out of a total of 752 new firms surveyed, some 724 checked the market as a main location factor. Moreover, 343 firms checked freight cost as a main location factor. Assuming complete overlapping of these subsets, such that the universal set of plants influenced by area growth is contained entirely

⁸ Greenhut and M. Colberg, *op. cit.*

within the larger figure, a proportion at least as large as 724 firms out of 752 located in the surveyed area because of normal economic growth, i.e., growth of a particular market.

TABLE I—SELECTED FACTORS INDUCING LOCATION IN FLORIDA: 752 FIRMS IN SURVEY

	I As Primary Factor	II As Secondary or Tertiary Factor	III Main Factor Total (Columns I and II)
Access to Markets (Present and Potential).....	488	236	724
Low Freight Cost, Raw Materials or Finished Product.....	139	206	343

Table II, extracted from a table in an Oklahoma report,⁹ shows a very large response rate given to the importance of local or regional markets and local or regional supplies of raw materials. These data, pursuant to our theory, suggest that the recent industrial development in Oklahoma is traceable to natural growth and not a sudden realization that a hitherto underdeveloped center has advantages that extend over a nation-wide scale.

Table III, extracted from a table in a West Virginia report,¹⁰ suggests even more strongly the same conclusions, especially if we evaluate the items "Transportation Facilities," "Location (Sources of Materials)," and "Location (Markets)" as alternative sides of the same general factor. Indeed, adding the three together would yield over 100%, suggesting that, at a minimum, the natural growth of the market area was an ever-present factor in practically every case.

⁹F. Cella and others, *Factors Affecting Industrial Location in the Southwest, 1954* (Norman, Oklahoma: Bureau of Business Research: The University of Oklahoma).

¹⁰James H. Thompson and Thomas S. Isaack, *Factors Influencing Plant Location in West Virginia, 1945-1956* (Morgantown, West Virginia: Bureau of Business Research: West Virginia University).

TABLE II—COMPARISON OF IMPORTANCE ATTACHED TO PLANT LOCATION FACTORS BY FIRMS IN THE STUDY AREA¹

Plant Location Factors	Importance Rating Attached to Factor (All Firms)	
	%	Rank
Availability of product markets.....	82	1
Wages and salaries.....	81	2
Abundance of general labor supply.....	79	3
Availability and cost of raw materials...	78	4
Labor's will to put out a full day's work.	78	5
Workers' happiness and well-being....	78	6
Cost of transportation of products to principal markets.....	76	7
Cost of transportation of raw materials..	75	8
Abundance of skilled supervisory and professional labor.....	75	9
Cost of living.....	75	10
Time required for delivery of products to principal markets.....	75	11
Cooperativeness of other business people	74	12
Availability of building sites.....	75	13
Climatic conditions.....	73	14
Hospital, sanitation, education, and welfare facilities.....	73	15
Time required for delivery of raw materials.....	72	16
Availability and cost of utilities.....	72	17
Plant rental or construction costs.....	72	18
General living conditions for key personnel.....	71	19
Insurance rates.....	71	20
Availability of business credit.....	70	21
Availability of business information....	69	22
Labor laws.....	69	23
Taxes.....	69	24
Recreational facilities.....	68	25
Availability of risk capital.....	67	26
Labor unions.....	65	27
Time required for delivery of machinery, equipment and supplies.....	62	28
Cost of transportation of machinery, equipment and supplies.....	61	29
Competence and stability of state and local government.....	61	30
Availability of prime contractors.....	58	31
Editorial policy, news coverage, circula- tion of newspapers.....	57	32
Availability of subcontractors.....	55	33
Subsidies or other incentives by state or local groups.....	45	34

¹Extracted from the table on Page 9 of the report, *Factors Affecting Industrial Location in the Southwest, 1954*, by F. Cella and others (Norman, Oklahoma: Bureau of Business Research, the University of Oklahoma).

Conclusion

Let us summarize and conclude as follows: When comparative advantage exists between areas and trade is free, the

TABLE III—FACTORS INFLUENCING CHOICE OF SITE BY FIRMS LOCATING PLANTS IN WEST VIRGINIA DURING PERIOD 1945-1956¹

Locational Factor	Number of Firms Listing Factor		
	"Strongly Influenced" (1)	"Had Some Influence" (2)	Total (Column 1 & Column 2) (3)
Adequacy of Labor Supply.....	34	29	63
Transportation Facilities.....	27	33	60
Location (Sources of Materials).....	40	19	59
Location (Markets).....	27	28	55
Labor Costs.....	19	33	52
Labor Relations.....	13	31	44
Availability of Suitable Building.....	24	18	42
Community Attitudes.....	17	23	40
Electricity (Availability and Cost).....	13	26	39
Superiority of Physical Site.....	19	19	38
Water Supply.....	14	15	29
State and Local Taxes.....	3	24	27
Fuel (Availability and Cost).....	9	17	26
Community Facilities.....	4	19	23
Preference for Home State.....	9	11	20
Community Financial Assistance.....	7	9	16
Other Factors.....	3	1	4

¹ Based on replies from managers or other executives of 89 firms. Extracted from Table 5 Page 15 of the report, *Factors Influencing Plant Location in West Virginia, 1945-1956* by James H. Thompson and Thomas S. Isaack (Morgantown, West Virginia: Bureau of Business Research, West Virginia University.)

respective areas will tend to pursue the activities for which they are best fitted. In the process they gain the further advantages of increasing skills through specialization.

As an area develops industrially, regardless of whether this development is comparatively more or less than that taking place in another area, it becomes a

more and more attractive place in which to locate a plant. And while a given plant may be well oriented to the market pattern that had once prevailed, a change in growth rates among areas alone sets forth the condition where the given plant may no longer be oriented properly to the "entire" new pattern of demand. If then the previously underdeveloped market area has attained sufficient size to justify a branch plant orientation directly to it, a better practice than the scrapping of the original plant and the building of an entirely new enlarged structure at a slightly different location is to leave the older plant for service of the markets best situated with respect to it, while constructing a *new branch plant* to serve the newly sufficient area of demand.¹¹

The above description will approach the glorified stature of a verified theory if the findings of the factors which account for new industrial location in underdeveloped states are heavily weighted in favor of this theory. This weighting, we assert, is readily evidenced by the great emphasis given to the market and transport cost factors by respondents to location surveys, as cited in the paper. They suggest that our theory is readily descriptive of much of the industrial development taking place today in the United States. Further, they suggest that the main role and possibly the greatest accomplishment of industrial development

¹¹ We are not claiming that growth of markets alone accounts for industrial development since surely market growth is often (and in some cases may have to be) supplemented by technocratic developments, such as truck transport, or the existence of local raw material supply. We are claiming simply that the market factor is the most vital and prevalent factor in the industrial development of hitherto underdeveloped areas.

Furthermore, an industry, such as the paint, varnish and lacquer industry which includes more than 1500 plants, tends to be scattered widely over space. Its plants locate readily in underdeveloped areas, with the smaller ones being influenced as much by the price policies of the large firm as by any other factor. Indeed, many small plants may be found in peripheral areas having located there to take advantage of the price set by the larger concerns and the growth and comparative sufficiency of the local market.

groups is not the discovery of substantially new conditions, nor the attracting to a given place of an enterprise which otherwise would never have come close to it; rather, the main role of these groups is to provide that kind of information which "facilitates a location selection" and which tends to "move a prospective plant from a nearby alternative point to the one desired most by the development agency."

It is believed that industrial development groups in underdeveloped areas are generally in error when they infer that their state (or area) possesses a unique set of cost advantages and that this is responsible for their new development. What they should say most of the time is

that their market has developed to a size large enough to support a branch plant and that, if the branch plant is located in their state (or area), it will reap additional advantages.¹² This, we assert, is the true basis for much of the industrial growth of underdeveloped areas in the United States.

¹² R. Lichtenburg, *One Tenth of a Nation* (part of the New York Metropolitan Region Study, Cambridge, Massachusetts: Harvard University Press, 1960) observes in chapter two that the New York region has a smaller proportion of its manufacturing employees engaged in national market industries than holds true throughout the United States. Elsewhere in the same chapter he cites industries which import raw materials via the Port of New York as leaders among those which sell to national markets. Clearly, sections distant from the mid-northeastern states tend to suffer transport disadvantages which limit their chances for selling to national markets. In such cases, even though local cost advantages may prevail, the local markets must grow sufficiently before locations in such areas become feasible.

The Problem of the Conservation of Salmon with Special Reference to Bristol Bay, Alaska

By JULIAN V. MINGHI*

Introduction

FISH is one of man's oldest foods, and on the high seas has been reaped without sowing through the ages by man. Traditionally, in the absence of mutual agreements between states, regulations of one nation apply only to nationals of that nation on the high seas. During the last century there has been an acceleration in exploitation by expansion of frontiers, technical progress, accumulation of capital, and increases in population and spending power. The old belief in the renewed and inexhaustible supply of fish has been proved fallacious. Hence, according to dominant interest, three concepts of the high seas and their resources have grown up: (1) that they are not subject to the sole jurisdiction of any state, (2) that fish are not "property" until caught, and (3) that there should be a development of customary rules of international law for the conservation of the resources of the sea.

As the interests of the United States have been confined mainly to fisheries adjacent to her own coast, a domestic policy of conservation has been adopted. The implementation of this policy is complicated, however, by the fact that other states, traditionally more oriented to high-seas fishing, such as Japan, hold to the concept of the freedom of the seas and of their resources. The question of competing national interests therefore arises. This underlines the basic difference between a policy which aims to

conserve a resource located completely within the jurisdiction of the national state and one which is *not* under sole jurisdiction. In addition to this political consideration, biological and economic factors complicate the situation.

This paper will examine these other major complicating factors, particularly as they apply to North Pacific salmon, and the competition over its exploitation by the United States and Japan.

The salmon spawns and hatches in fresh water streams. By beginning and finishing its life cycle within the boundaries of national domains it comes within the full jurisdiction of the coastal state—that is, while it is not on the high seas. Hence, for the coastal states even the usual basic premise in disputes involving fishing outside territorial waters that the living resources of the high seas are common to all mankind, is overshadowed by property claims. Salmon involved in the dispute in the North Pacific Ocean are spawned and hatched in Asian and American waters. The Asian-spawned salmon are mainly from Soviet Siberian streams while the American-spawned are from Alaskan streams, specifically those flowing into Bristol Bay. Because of their strong homing instinct the salmon, after three to five years on the high seas, return to their parent stream. In climbing upstream to reach the spawning grounds their physical state deteriorates and hence they are of greater commercial value as they enter fresh water from salt water than at any other time thereafter. The necessary concentration of the salmon as they run toward their parent streams

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from the open sea renders commercial exploitation easiest at the mouth of these streams.

After the war, measures were taken by the United States by which Japan would be excluded from fisheries where salmon spawned in Bristol Bay streams occur. Japan was "forced" by the Peace Treaty to join Canada and the United States as a party to the International North Pacific Fisheries Convention (I.N.P.F.C.) in 1953. The Convention established a zone contiguous to the American coast in which no party to the Convention was allowed to fish for salmon. The line 175 degrees West marked the westward extension of this zone, which has since become known as the "zone of abstention." At the time this line was thought to divide satisfactorily American-spawned salmon from Asian-spawned, although it has since been established by extensive research that Alaskan-spawned salmon are often found west of the line and that there is, in fact, a broad zone of "intermingling" of both Asian- and Alaskan-spawned salmon which the line transcends.

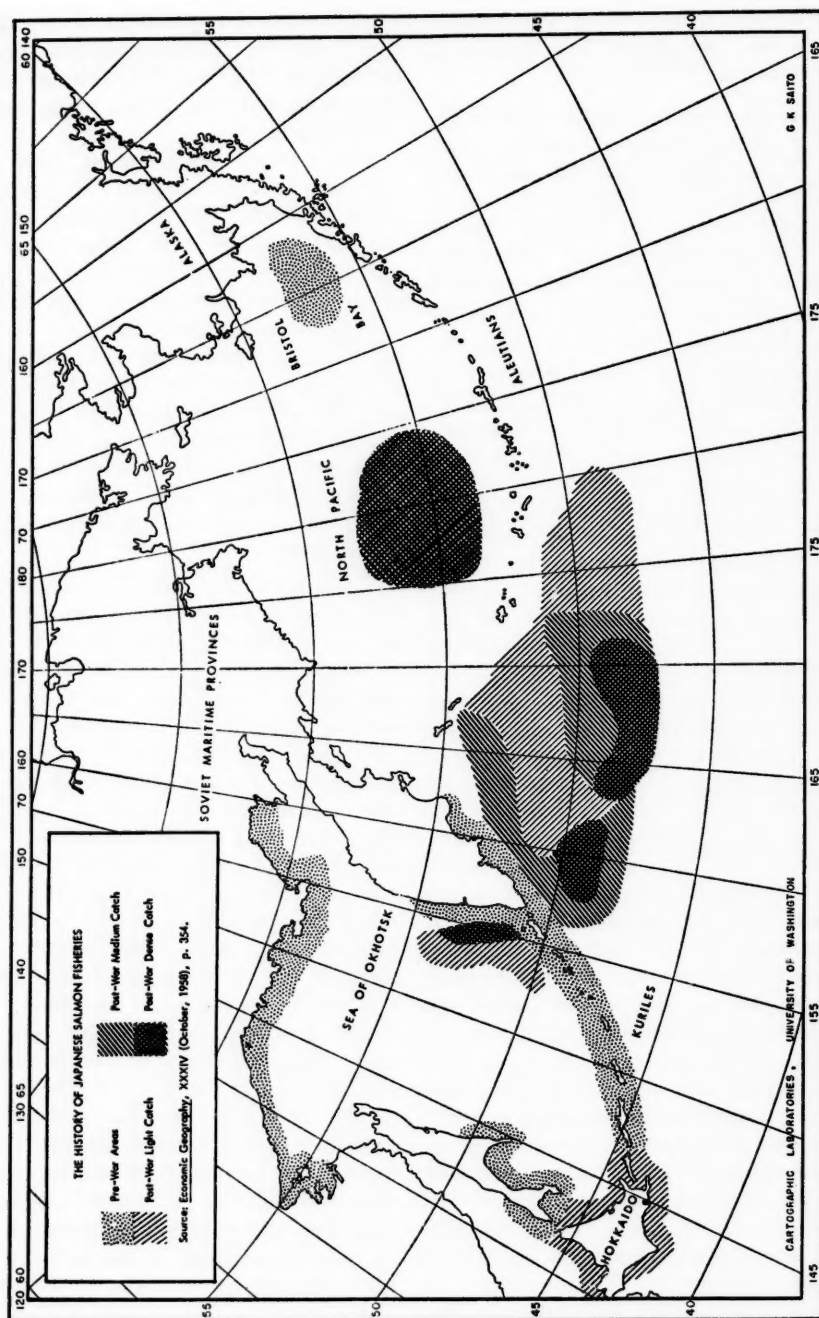
Biological Complication

It was thought that Alaskan-spawned salmon could be conserved at an optimum sustained yield level by allowing for a minimum escapement and by controlling fishing. So far this policy has not been successful to any significant degree. When a decline in yield took place under these conditions there followed a premature supposition that the main cause of the decline was due to Japanese fishing. The Japanese have had a long history of salmon fishing in the Pacific (see Map) although they began large-sale high-seas fishing in I.N.P.F.C. waters only in 1955. The salmon runs in Bristol Bay however had been on the

decline for twenty years previously (Figures 1 and 2). The explanation then is not simple. In fact, over-fishing would seem to be only one of the many causes of depletion.

The natural environment does not provide an unchanging background against which the exploitation of resources takes place. On the contrary, the natural environment is affected by cyclical and periodic climatic change and by ecological upsets caused by such human agencies as deforestation, water pollution, and dam obstructions. Of these human agencies only water pollution is of any possible importance in Bristol Bay. These disturbances have direct impact on the natural mortality rate of salmon and influence the rise and decline of salmon population.

The salmon is pelagic and anadromous and a conservation policy, unlike that applied to other types of fish, must be in terms of "flow" rather than of "stocks" of salmon. The salmon migration routes are closely related to ocean currents. In turn these can be related to vertical distribution of water temperature and to degree of salinity. It is easy to see, then, that there is a yearly variation in the time of development and distribution of salmon because of this relationship of the salmon to sea conditions and to climate. Nevertheless, many years of intensive research will be necessary before depletion can be satisfactorily explained. No doubt continued surveys will establish some definite pattern of fluctuation although so far the evidence has been conflicting and only serves to underline the present extreme unpredictability. Predictive devices must be found to explain such problems as short-term and long-term fluctuations of salmon numbers and as natural mortality rates, both on the high seas and in fresh water. Uda concludes that, "in the interests of conserva-



tion and management of salmon resources and fisheries, closer investigation of the ever-changing environmental conditions should be promoted."¹

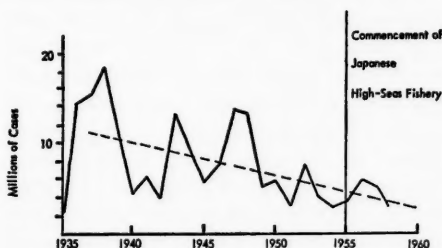


FIGURE 1—BRISTOL BAY RED SALMON PACKS, IN MILLIONS OF SALMON: 1935-58.

Man cannot directly control fishery productivity where the abundance of species is governed by the changing hydrographic and biological conditions

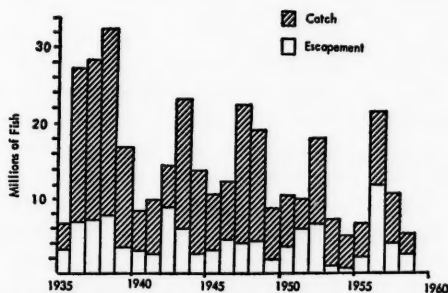


FIGURE 2—RED SALMON RUN IN BRISTOL BAY IN MILLIONS OF SALMON: 1935-58.

at an early stage in the life of the salmon. That is to say, there is no simple relation in future runs of salmon to intensity of fishing. Causes of the fluctuations in salmon runs are rather a combination of natural changes, man-made environmental changes, and changes in fishing intensity. The principle cause of the decline of the Kamchatka salmon runs in 1948 was not due, according to Soviet

observers, to over-fishing but to other phenomena, such as the high mortality rate of eggs and of young during the seaward migration, less favorable conditions for reproduction in 1943-1944, and a general reduction in runs in 1943-1945.²

Economic Complications

Organic and inorganic resources have, through the course of history, undergone an intensive period of exploitation followed by a reduction in output often to quantities and qualities below successful economic exploitation, or by a curtailment of the activity through extinction or because of substitution of the particular resource. As long as technical innovations and scientific advances allow substitution to parallel the exploitation of known resources, conservation has doubtful justification.

Scott has stated that "when the state decides to take action to increase the degree of conservation, it should consider both the benefits and the costs of such policies. The social costs of conservation are potentially great, for, if the depletion of resources is due to the organization of the business on a small scale, the indicated policy, to increase the average size of the firms, might imply monopolistic conditions in labor markets and unduly high prices in the product market, not to mention the application of a brake to technical progress."³ The implications of conserving a fishery are not only a matter of applied biology but they have far-reaching effects over much wider a field, covering social and economic questions. The purpose of conservation in commercial fishing is to ensure a certain level in yields in the future by the main-

¹ F. V. Krogus and E. M. Krochin, "Means to restore and increase runs of Kamchatka Salmon," translation C. E. Atkinson (Seattle: United States Fish and Wildlife Service, April 1956), p. 3.

² Anthony Scott, *Natural Resources: The Economics of Conservation* (Toronto, Canada: University Press, 1955), p. 96.

³ M. Uda, "The Salmon Fisheries, Seminar 3," *Fisheries Seminars* (Nanaimo, British Columbia: Fisheries Research Board of Canada, March-May, 1959), pp. 11-12.

tenance and improvement of the stock and of the biological base of the fishery. It is a public policy which seeks to increase future supplies of the resource by action now.⁴ This is done by attempting to secure a sustained optimum yield at least possible cost, to obtain a better remuneration for labor and capital employed, and to preserve a natural cheap food for the community.⁵ However, the measures taken often entail the restriction of production with varying effects on different vested interests.

In Bristol Bay, Alaska, in 1958, only two days' fishing per week were allowed during the four-and-one-half-weeks season and yet the *escapement*⁶ counted was only about 2.5 million salmon. The management of the fishery was based on daily reports of escapement and catch per unit effort (average daily catch per two-man boat). In other words, the more gear used in fishing the fewer the fishing days allowed. There has been a general decline in catch per boat and yet there has been no decrease in number of boats. The *annual catch* over the last thirty years has been decreasing at a greater rate than has escapement. Not only has the annual catch shown a general decline but the more valuable species have taken up an increasingly lower proportion of the total catch. There arises, then, the question of the inefficient use of labor since there are fewer salmon caught per fisherman now than twenty years ago. It is estimated that the Bristol Bay fishery is working at only twenty percent of its potential capacity. The number of salmon caught per man per season by the Japanese high-seas fishery is about 2.1

times that of Bristol Bay.⁷ However, if respective fishermen-days and amounts of gear are computed the *efficiency ratio* highly favors western Alaska fishing.

Much of the scientific information needed in Bristol Bay and the associated high-seas areas over which its salmon move is lacking. The investigations by the United States and Canada into the sockeye salmon fishery of the Fraser River, on the other hand, have a much longer history and have benefitted from funds several times greater than those granted to Bristol Bay research although the biological complications are considerably greater in the case of Bristol Bay salmon.

There is often a basic difference between maximum physical sustained yield and optimum economic yield. If the objective of a rising or steady sustained physical yield is not attained then growing inefficiencies will occur and measures to attain this yield may be questionable. However, if the resource is appreciably increased it may lead to the attraction of new entries into the industry, thus tending to neutralize any possibility of offsetting inefficiencies. The interests that have shared the costs of sacrifices under conservation measures get no increased return for, as the physical volume of the resource increases, new entries maintain the saturation point at the conservation level. This can be avoided by legislation, not only on a technical and time basis but on a basis of rationalization of the industry in terms of capital and labor inputs and on limitation of entry into the industry. The concepts of free enterprise and conservation have found it impossible to co-exist without detriment to both. In the international field the United States' case for extra-territorial jurisdiction to enforce her conservation

⁴ *Ibid.*, p. 53.

⁵ Jozo Tomasevich, *International Agreements on Conservation of Marine Resources, with special reference to the North Pacific* (Stanford, California: Food Research Institute, Stanford University, 1943), p. 47.

⁶ Number of fish allowed to run upstream to the spawning grounds.

⁷ *International North Pacific Fisheries Commission Statistical Yearbook, 1957.*

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laws would be somewhat sharpened if an attempt were made to strengthen the economic structure of the industry. A better ratio of catch to effort could be attained with appropriate legal measures.

The above analysis explains the inconsistent attitudes taken by various interest groups in the United States to the principle of conservation in general, and its application in particular. While conservation has physical, social, and economic connotations, it does not fully consider cost over time. Conservation of salmon must essentially be a long-term policy. Even so, time has shown that man has less physical and exclusive control over the salmon than originally thought at the conception of the conservation policy. On the other hand, technical innovations have greater impact in the short run.

Conservation requires the nation to pay today for the chance of a sustained supply for economic exploitation in the future. It must sacrifice ordinary investment and consumption now for possible future benefit. Hence there seems to be a need for a benefit:cost-type analysis to be carried out before a conservation policy is undertaken, weighing the benefits of conservation against the losses of current income, for in a conservation program the government and its agencies apply a lower rate of discount to the future than the various private interests involved. Up until 1919, "cooperation of the salmon industry with the government in the work of conservation of the salmon fisheries" was "practically negligible."⁸

The ends of a conservation policy tend to be inflexible. They cannot easily change *pro tanto* with the changes of emphasis between different branches of the economy. As with the spread of

commercial fishing beforehand, there has been a south-to-north extension of sports fishing for salmon on the West coast of North America. In terms of capital investment, sport fishing has already replaced commercial interests in many places. There is a definite trend to ascendancy in importance of sport fishing over commercial fishing in coastal waters.

Other factors to be considered, especially in the case of salmon, are ignorance and risk. The assumption that the decision-makers in conservation have perfect foresight has been proved erroneous and there is always the risk that short-run prices will change and profits will disappear.

Although the policy behind conservation of salmon ostensibly seeks to benefit the fishermen of all nations, it is often initiated to prevent extinction of the fish and later may be used to justify a local or national fishing monopoly.

Conclusion

From the above, the complexity of the scientific base of the salmon fishery and the consequent complexity of factors which go to explain depletion may be realized. Conservation measures seem so far to have played a minor role in determining runs in Bristol Bay. Simply stated, the problem resolves itself into a question of physical/biological relationships, as well as human/biological relationships.

Even with the assumption of a continued market demand at present price levels for salmon there is grave danger of the supply falling below a threshold level required for successful economic exploitation. Against this uncertain background it is difficult to view realistically the activity of the United States' and Japanese salmon fishing industries in the

⁸ Daniel B. DeLoach, *The Salmon Canning Industry* (Corvallis, Oregon: Oregon State College, 1939), p. 39.

North Pacific from anything but a short-term angle.

The "purpose of conservation" as expounded by Tomasevich in 1943 has certainly not been achieved in Bristol Bay by the Fish and Wildlife Service. However, it is logical enough to con-

clude that without any preventive measures by the Fish and Wildlife Service the resource would have been depleted at a faster rate than it actually has and possibly would have already reached a point prohibitive to economic exploitation, or even have become extinct.

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Reports and Comments

The Nature of Competition in the Motor Transport Industry

IT is difficult to assess the degree of "competitiveness" of any industry. It is even more difficult to determine how competitive a currently regulated industry would be if regulation were eliminated. Though we possess certain competitive indicia there are usually enough institutional and nonstructural features in any given situation to cause the outcome to deviate more or less from any particular model. Prediction of the consequences to be expected through deregulation of an industry which, in essence, grew up under the aegis of federal control would therefore appear to be exceedingly hazardous. Yet few seem to exhibit much caution in predicting the results of just such a policy in the motor transport field.

Many economists have emphasized the competitive nature of the trucking industry. For example, Pegrum asserts that "the economic structure of motor transport is that of a highly competitive industry."¹ Westmeyer argues that "if no legal restrictions existed, highway transportation would be highly competitive, and there is no reason why the public should not be permitted to enjoy the benefits of some competition in this field."² Keyes suggests that for the "motor-trucking . . . industry the competitive analysis is valid, and nonintervention on the part of government is indicated."³ Peterson long ago argued that "the case for regulation—except as it applies to safety and responsibility—is not especially impressive."⁴ Many other comments in a similar vein could be given. So firmly engrained is this vision of the

motor carrier industry that it has achieved the status of a piece of conventional wisdom. The implication of this view is that economic regulation is therefore entirely superfluous at best and a cause of serious economic waste at worst.⁵

In addition, the Interstate Commerce Commission has been accused of deliberately oligopolizing the trucking industry. Adams and Hendry assert that "if giantism and oligopoly come to the trucking industry this will not be the result of natural economic forces but of benign tolerance, if not active promotion, by the I.C.C."⁶

The upshot of all these views is that the trucking industry if let alone would conform closely to the competitive model and would automatically and impersonally establish a satisfactory position of stable equilibrium. If this assessment of the nature of the motor carrier industry is in fact valid then for some 23 years our public policy in this realm has been totally misguided. The innumerable cases decided by the Interstate Commerce Commission and the strenuous efforts by many parties designed to bring order to an industry which apparently does not need it, all represent a monstrous boondoggle emanating from either a basic misconception or an insidious desire to freeze and protect given route patterns for a favored few.

¹ See *Competition, Regulation, and the Public Interest in the Motor Carrier Industry*, Report of the Select Committee on Small Business, United States Senate, Washington, D. C., 1956. This report recommends in part that the Interstate Commerce Commission "take immediate steps to remove the shackles it has tightened around a large segment of the trucking industry and thus usher in a new era of wholesome competition to the benefit of all qualified trucking concerns." p. 28.

² Walter Adams and James Hendry, *Trucking Mergers, Concentration and Small Business: An analysis of Interstate Commerce Commission Policy, 1950-1956*, Select Committee on Small Business of the United States Senate, Washington, D. C., 1956, p. 7.

¹ D. F. Pegrum, *Public Regulation of Business* (Homewood, Illinois: Richard D. Irwin, 1959), p. 582.

² Russell E. Westmeyer, *Economics of Transportation* (Englewood Cliffs, New Jersey: Prentice-Hall, 1952), p. 413.

³ Lucile S. Keyes, *Federal Control of Entry into Air Transportation* (Cambridge, Massachusetts: Harvard University Press, 1951), p. 413.

⁴ G. S. Peterson, "Motor Carrier Regulation and Its Economic Bases," *Quarterly Journal of Economics*, August 1929, p. 16.

In view of the serious implications of this view and the current critiques of the Interstate Commerce Commission emanating therefrom, it seems worthwhile to reappraise the competitive nature of truck transport.⁷

To what extent do the features of this industry conform to the competitive pattern? In the first place, with no ownership in the right-of-way the minimum investment required to establish a firm is relatively small, probably on the average within a range of \$10,000-\$50,000, depending upon circumstances.⁸ The production units (except terminals) are similarly very small, inexpensive, not highly specialized and not irrevocably committed to specific markets or regions. Truck transport is not subject to any marked economies of scale⁹ and hence does not fit the historic pattern of natural monopoly. Fixed costs are not high; hence, according to Pegrum, "competition among motor carriers cannot be ruinous [for] ruinous competition . . . can arise only when fixed costs are a large part of total costs . . ."¹⁰ The large number of trucking companies (about 18,000 Class I, II and III carriers), the rapid capital turnover (about three times per year) and the high ratio of variable to total costs (somewhat above 90 percent for "normal" traffic density) bear out the above characteristics.

These features seem to represent the crux of the perfectly competitive arguments. However, are these enough in and of themselves? Or are there other characteristics of truck transport which would be inconsistent with the competitive model? Let us examine the latter.

One of the requirements of a highly competitive market is a homogeneous product.

⁷ It is not altogether clear that the emphasis upon the competitive nature of the motor carrier industry includes the increasingly important problem of private carriage. Obviously, common carriers are competitive not only among themselves but also with private carriers and this situation exists or would exist whether common carriers were regulated or not. The potentialities of private carriage clearly condition the competitive outcome. In the present article primary emphasis is upon common carrier transportation.

⁸ For a brief discussion of entry costs see I.C.C. *Administration of the Motor Carrier Act*, Hearings Before Select Committee on Small Business, U. S. Senate, 84th Congress, 1st Session, Government Printing Office, Washington, D. C., 1956, pp. 324-326.

⁹ Merrill J. Roberts, "Some Aspects of Motor Carrier Costs: Firm Size, Efficiency and Financial Health," *Land Economics*, August 1956.

¹⁰ Pegrum, *op. cit.*, p. 531.

The output unit in truck transport is probably best construed in terms of a "truck journey"¹¹ which of course is translatable into the more usual ton-mile units. But is a truck journey by any particular carrier equivalent to that of any other? The answer is clearly in the negative. Motor transport represents a service and uniquely bound up with such service are highly variable qualitative elements. One truck journey may be vastly different from another on account of the specific qualitative factors such as speed, dependability, safety and responsibility. These create vast potentialities for "product differentiation" which were certainly not unknown in the era prior to the Motor Carrier Act of 1935. Furthermore, many of these qualitative elements tend to correlate positively with carrier size, especially financial responsibility, safety and general availability of equipment units. This is difficult to document fully but certainly the larger firms tend to have more adequate insurance coverage, larger amounts of working capital, more highly specialized driver training programs with careful initial selection procedures, superior terminal facilities and a somewhat higher ratio of equipment units to sales than smaller firms. Though many exceptions may be noted, it seems reasonable to suggest that the product produced by motor carriers is (a) not homogeneous and (b), somewhat superior for the larger firms.¹²

Furthermore, though the various studies of motor carrier costs do not indicate significant economies of scale neither do they show

¹¹ A. M. Milne, *Economics of Inland Transport* (London, England: Pitman, 1955), pp. 121-122. See also, George W. Wilson, "On the Output Unit in Transportation," *Land Economics*, August 1959, pp. 266-276.

¹² D. Philip Locklin gives some support to this although for a rather different reason. He suggests that "even if there were no economies in large-scale operations, it is possible that the service advantages of large concerns would give them a competitive advantage over smaller ones in the struggle for traffic. There is some indication that shippers prefer to ship by a motor carrier which provides . . . a complete service to the ultimate destination of the shipment As long as the single-line service is preferred, the large carrier operating over an extensive area has an advantage over smaller concerns." *Economics of Transportation*, 4th edition (Homewood, Illinois: Richard D. Irwin, 1954), pp. 681-682. More recently Smykay has stressed service features. E. W. Smykay, "An Appraisal of the Economics of Scale in the Motor Carrier Industry," *Land Economics*, May 1958, pp. 146-148.

any diseconomies.¹⁵ At the very least they show long-run cost constancy. But long-run constant costs make it impossible, a priori, to define the industry's market structure for the optimum firm size is indeterminate. This means of course that "the state of competition cannot be defined, since the number of sellers is not discoverable."¹⁴ One of the reasons for such long-run cost behavior is the high degree of flexibility of capital with respect to output changes: one of the key reasons which has been adduced as evidence of the inherently competitive nature of the industry!

But if there are no apparent diseconomies to bigness and if service features correlate positively with size, then in the absence of regulation we should naturally expect a growth in concentration. When therefore it is found that concentration is tending to increase this may be just as much, or more, the result of naturally operative economic forces which the Commission has been accused of thwarting.

Furthermore, there are several other aspects of motor transport which would lead one to question whether the industry would reach a point of stable equilibrium in the absence of economic regulation. For one thing, the firms are subject to short-run, decreasing

per-unit costs as traffic increases,¹⁵ which tends to cut-throat competition in the short-run with excess capacity. This is not especially serious since the short-run is in fact a rather limited period of time. More serious, however, is the large amount of cost which is joint. All transport firms which employ containers are subject to similar bundles of unassignable costs and they are substantial even if "fixed" costs are not. This creates distinct possibilities of sufficiently intense competition to engender consolidation especially where traffic which is primary haul for one carrier in one direction is essentially a by-product for another carrier.¹⁶ Though the evidence of extreme instability in the trucking industry during the 1930's is not completely relevant, insofar as the industry at that time "became a haven for the unemployed"¹⁷ and was subject of course to other exogenous disturbances, the past history is at least suggestive of the possibilities indicated above. It is my contention that the Great Depression augmented the degree of instability in the 1930's but was not the basic nor sole cause of it. In short, it does not appear that truck transport sans all economic regulation would establish the kind of stable equilibrium postulated by competitive models. Certainly the history of the trucking industry prior to 1935 indicates an excess of instability. While this in itself is not conclusive because of the infant status of the industry and the Great Depression, the only historical evidence we have belies any presumption of a satisfactory equilibrium outcome. Furthermore, it does not appear that the industry possesses enough of the required conditions to constitute a perfectly competitive market or set of markets.

There is of course no point in emphasizing the large number of trucking firms currently in existence nor to point to the low percent of output of the top four or ten firms, for the data pertain to the entire nation and all of the firms do not compete with each other in every transport market defined in terms of commodities and /or regions. As had been

¹⁴ The best and most authoritative recent study is Merrill J. Roberts, "Some Aspects of Motor Carrier Costs: Firm Size, Efficiency, and Financial Health," *Land Economics*, August 1956. See also, Robert A. Nelson, *Motor Freight Transport for New England*. A Report to the New England Governors' Conference, Report No. 5, October 1956. The latter report concludes that "size of firm bears little relation to operating costs. Consequently, it can hardly be maintained that there are economies of large size available in the industry, or a tendency toward monopoly stemming from that cause." (p. 34) Somewhat more cautiously Roberts suggests that "the operating features identified with high unit costs are commonly associated with small firms but they are not a necessary feature of these companies." *Op. cit.*, p. 231.

In the recent exchange between R. A. Nelson and E. M. Smykay concerning cost linearity ("The Economics of Scale in the Motor Carrier Industry; A Reply" and Rejoinder by Smykay, *Land Economics*, May 1959, pp. 180-187) Nelson criticizes Smykay's failure "to support a case against cost linearity" (p. 181). But, as will be shown, one can accept long-run cost linearity and still not subscribe to the competitive nature of truck transport. Indeed, Nelson divorces himself from "those who implicitly assume conditions of perfect competition in the trucking industry" on the grounds that "eruption of rate wars indicates that trucking is a few miles down (or up) the rivalry pike from the pole of pure competition." (p. 185).

¹⁵ E. H. Chamberlin, "Proportionality, Divisibility and Economies of Scale," *Quarterly Journal of Economics*, February 1948, p. 229.

¹⁶ See George W. Wilson, "Current Criticisms of the Interstate Commerce Commission," *Current Economic Comment*, August 1959, pp. 12-13; and William J. Hudson and James A. Constantin, *Motor Transportation* (New York, New York: Ronald Press, 1958), p. 170.

¹⁷ Howard Nicholson, "Motor Carrier Costs and Minimum Rate Regulation," *Quarterly Journal of Economics*, February 1958.

¹⁸ Merrill J. Roberts, "The Motor Transport Revolution," *The Business History Review*, March 1956, p. 79.

pointed out, "the market [for motor carriers] must be defined by the number of carriers operating between two geographic points" ¹⁸ Measures of concentration and numbers of firms are meaningless unless the specific markets are clearly defined. In many transport markets the number of "small size" trucking firms required is undoubtedly well below the level beyond which mutual interdependence (i.e., oligopoly) results.

I do not wish to suggest that the general view is completely or even largely wrong but merely to point out that the allegation of competitive-like structure and results is based on rather shaky and incomplete foundations. We need much more information about shipper preferences, the capacity requirements of specific transport markets, the precise nature of the relationship between size and service, and so on. Until we have more complete information on these points it ill behooves capable economists to castigate Interstate Commerce Commission policy in particular and economic regulation in general with such assurance in terms of its effects upon market structure. Indeed, if my conjecture is correct, the most fruitful context in which to discuss the consequences of substantial deregulation in motor transport is that of oligopoly. In particular, the models stressing oligopoly with threat of entry or a "limit price" analysis, seem most appropriate.

One other point to be taken up in this connection: Is the Interstate Commerce Commission in fact deliberately seeking to create oligopoly in truck transport as Adams and Hendry have charged? Is the Commission seeking to "substitute a cartel for a competitive system" as Mr. Justice Douglas implied in his dissent in the McLean case? ¹⁹

Let us look first at the trends in concentration. According to the data of Adams and Hendry, the share of total Class I operating revenues of the four largest firms increased from 5.84 percent to 7.01 percent from 1950 to 1955 while the share of the 75 largest firms rose from 38.19 percent to 44.44 percent. ²⁰ The share of the 100 largest firms, however,

rose from 43.61 percent to only 44.62 percent over the same period. ²¹ Though the larger firms were growing at a relatively faster rate, this resembles more the pace of a glacial drift than galloping oligopoly or incipient giantism. As Meyer *et al* point out, "for any but an economist with an extreme suspicion of concentration, these trends indicate a continuation of the current low level of concentration." ²² Thus, even under Interstate Commerce Commission "shackles" there has been no alarming increase in concentration. Furthermore, if, as argued above, some "natural" rise in concentration is to be expected, it becomes a moot point whether the Commission is accelerating or retarding the trend for the various commodity and back haul restrictions, though undoubtedly "uneconomic," have the effect of maintaining more firms than would otherwise be the case in specific markets. This aspect needs to be balanced against entry restriction to assess the Commission's total impact on concentration.

But more serious is the charge of deliberate Interstate Commerce Commission preference to larger firms when mergers are being considered. It is evident that larger firms possess more resources for preparing the case for merger and hence presumably do a better job in their submissions to the Interstate Commerce Commission. If the larger firms generally have better performance records and more responsible operations, then this enhances the chance of Interstate Commerce Commission approval. These factors, solely without premeditation or any malign intent to create an oligopoly, could easily result in the larger firms having a better record in merger applications than small firms. The examples cited by Adams and Hendry do, of course, indicate something of a "double standard" but there are scarcely enough cases cited to warrant a blanket charge of deliberate intent. Furthermore, many of the examples involve the large household goods carriers which concern a rather different type of market than carriers of general freight.

This does not disprove the Adams and Hendry charge but merely suggests that another explanation may be equally valid. Proving deliberate intent is at best a hazardous occupation and I suggest that

¹⁸ J. R. Meyer, M. J. Peck, John Stenason, Charles Zwick, *The Economics of Competition in the Transportation Industries* (Cambridge, Massachusetts: Harvard University Press, 1959), p. 212.

¹⁹ *McLean Trucking Co. v. United States*, 321 U.S. 67, (1944)

²⁰ Adams and Hendry, *op. cit.*, p. 33.

²¹ *Ibid.*, p. 27.

²² Meyer, *et. al.*, *op. cit.*, pp. 211-212.

Adams and Hendry do not have the whole story, as is indicated by the polemical nature of their report. It is certainly true that the Commission's job would be eased considerably if the number of trucking firms were substantially reduced but it is surely too much to say, on incomplete evidence, that the Commission has deliberately thwarted Congressional intent to achieve the "quiet life."

Again, in a general era of inflation with money tight and interest rates high, it does not take much prescience to decide which firms will have the easiest time obtaining funds for expansion. Nor can it be doubted that the age of expansion through ploughed-back earnings is at an end. Present and future capital needs in the motor carrier industry involve primary reliance upon external financing; and under present institutional arrangements the larger firms with long records of profitable, responsible operation will inevitably receive priority and preferred treatment. The small firm is in general a reminder to many financial institutions of the rough and tumble, slightly chaotic and largely unstable conditions which characterized motor transportation in the late 1920's and 1930's. It is the large firm with modern facilities, including data-processing equip-

ment, which conjures up those visions of permanence and stability so essential to the credit-seeker. Thus, recent and future growth prospects will be generally more favorable to firms already well established and of substantial size. There seems little doubt that this constitutes part of the explanation of the meager increase in concentration which has taken place since 1950 and will probably become a more important factor in the future. No deliberate Interstate Commerce Commission intent is necessary to account for present tendencies.

With respect to the widely held views regarding the competitive nature of truck transport and the recent attacks upon the Interstate Commerce Commission a quotation from Adam Smith seems appropriate: "If the rod be bent too much one way, says the proverb, in order to make it straight you must bend it as much the other."²³ My purpose here has been to engage in some necessary rod bending.

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²³ Adam Smith, *The Wealth of Nations* (New York, New York: Modern Library, 1937), p. 628.

The Rediscount Market for Land Contracts

THE land contract¹ as a low-equity means of transferring farm land is playing an increasingly important role in the farm real estate market. Information from the United States Department of Agriculture shows that the proportion of farm purchases financed by contracts doubled between 1946-47 and 1957-58. In 1958 about a fifth of all farm transfers in the United States were financed with land contracts. In the Lake States where land contracts are used more frequently than in some areas of the country, 39 percent of all farm transfers were financed in this way in 1957-58. For the year ending March 1, 1960, this figure had risen to 50 percent. In the Cornbelt, where land contracts are used less frequently, the 1957-58

figure was 18 percent; for 1960, it is 27 percent.²

In spite of the widespread use of this method of financing, there appears to be only limited opportunities for a vendor³ to discount his interest in a contract. The consequence is that the vendor finds himself holding a very illiquid asset. Many vendors are retiring farmers subject to the diseases and other uncertainties of old age which may call for sizeable amounts of cash within short periods. In light of this fact, the absence of a rediscount market takes on added significance.

² See *Current Developments in the Farm Real Estate Market, November 1958-March 1959*, Agricultural Research Service, United States Department of Agriculture, May 1959, pages 11-12. The figures for 1960 were taken from unpublished data received from the Agricultural Research Service, United States Department of Agriculture.

¹ The land contract is also known variously as a contract for deed, an installment contract, an installment land contract, a contract for the sale of land, a sales contract, a bond for deed, a purchase contract, and probably by other designations as well.

³ In this paper the person who sells real property by using the land contract will be referred to as the *vendor*; the person who buys real property on a contract, as the *vendee*; and the person who buys the vendor's interest in a contract, as the *buyer*, the *contract buyer*, or the *buyer of the vendor's interest*.

The existence in the Minneapolis-St. Paul metropolitan area of a rediscount market for contracts on urban property presented an opportunity to learn something about the operation of such a market and to determine some of the advantages or disadvantages it might have in a rural setting. Selected individuals known to be involved in the market were interviewed. They included a building contractor, two land contract buyers who also acted as mortgage lenders, a land contract broker, and three real estate dealers. The sample was restricted to this size because the primary purpose of the study was to gain insight relative to how the market works, rather than to get estimates of discount rates, etc. that could be tested statistically. Nevertheless, the estimates that were obtained are useful, especially in light of the scarcity of information on this aspect of the real estate market.

The lack of information is partly due to the very small proportion of land contracts recorded. Employees in the offices of the registrar of deeds in Hennepin and Ramsey counties where this study was made, reported that they usually advise people against recording contracts because they consider it an unnecessary expense. (There is a state tax of 15 cents per \$100 of unpaid balance on the contract as well as a recording fee. The federal tax of 55 cents per \$500 of the selling price is not paid until the title is transferred.) In rural areas of Minnesota the proportion of land contracts that is recorded varies between zero and 30 percent.⁴ The tendency of the institutional lenders to stay out of the field of contract financing is a further factor which makes the collection of statistics difficult.⁵

The urban land contract is typically used as a companion to a first mortgage. The vendee may act as the mortgagor in which case the land contract is written to cover the amount remaining on the purchase price above the down payment and the mortgage. (The vendor must co-sign the mortgage because he retains legal title to the property.)

Or the vendor may mortgage the property before the sale and then write the contract to cover the entire purchase price. In the second case the vendee may have no knowledge of the mortgage. In contrast to the urban land contract with its junior lien feature, the rural land contract is usually the only instrument used in financing a purchase.

Even though there is a well established market for the urban contracts, it is not a market in the sense that there are specified places where the transactions of the market occur. It is a highly personalized market, carried on by a number of individuals working separately and independently. Many of them have other business interests. In most cases the contract buyers are individuals rather than corporations. Lending institutions are excluded from investing in the usual urban contract because it represents a second claim to the collateral. The contract buyers invest their own money. They do not borrow on notes secured by the contracts, probably because of the junior lien features mentioned above. Some individuals have rather large investments in contracts and may devote all of their time to them.

The interest rate on urban contracts is almost always higher than on the accompanying mortgages. The difference is usually from one to one-and-a-half percentage points. The individuals interviewed expressed the opinion that this differential was determined primarily by what the market would bear and not by an additional risk resulting from the low equity. It is generally felt that the thirty-day cancellation period on contracts is sufficient safeguard for this risk.⁶

Urban property sold on a contract is typically priced higher than when other methods of financing are used. The estimates of the magnitude of this price increase were fairly consistent at about 10 to 15 percent. Higher prices are explained on the basis that vendors usually sell their urban contracts and that higher prices are needed to offset the discount that must be taken.

⁴ In Minnesota a vendor can terminate a contract thirty days after serving notice to the vendee that he is in default, and that the contract will be terminated if the default is not corrected within the thirty days. In case of termination, the vendor regains possession of the property and the vendee forfeits all payments that he has made. No other foreclosure proceedings are required, and there is no redemption period after the thirty days. There are other remedies available to the vendor, but this is the one most commonly used.

⁵ References to the characteristics of land contracts, to the ways in which they are used, to legal regulations governing them, and to real estate and mortgage law, relate to the situation in Minnesota. These statements may or may not apply to situations in other states.

⁶ The low down payment common on land contracts means that the vendee has an equity too low to meet the collateral requirements of most companies.

The discount rate on the vendor's interest was found to vary between 10 and 50 percent, with discounts of 25 to 30 percent being most common. The factors taken into consideration in setting the price (discount rate) are as follows: (1) equity relative to the purchase price, (2) value of the property, (3) credit rating of the vendee, (4) term of the contract, (5) characteristics of the mortgage on the property, and (6) interest rates and the relation of the contract to the mortgage.

The significance of the vendee's equity, value of the property, and the credit rating of the vendee is obvious. Roughly half of a contract buyer's earnings result from the discounted price he pays for the land contract. For any given rate of discount the shorter the term of the contract the higher will be the effective rate of return on the investment. Buyers usually refer to the length of the contract in terms of "rates of pay-off" by which they mean the amount paid on the principal per month, per thousand dollars of principal. A rate of \$10 per \$1,000 is considered good. In effect, this is an expression of a preference for contracts that do not run for a period longer than eight and one-third years.

If the vendor mortgages the property before the contract sale, the buyer of his interest in the contract typically assumes the mortgage and he is therefore interested in its terms. If the vendee is the mortgagor, the contract buyer is still interested in the mortgage terms because they will give some indication of whether or not the vendee will be able to meet his obligations. Furthermore, if the contract buyer finds it necessary to cancel the contract, he receives the property subject to the mortgage and must assume responsibility for it if he wishes to protect his own interest in the property.

A mortgage may also be a better indication of the value of the property than is the purchase price. Since mortgage loan companies are generally limited to loaning 60 percent of the appraised value of the property and since the mortgage is usually for the maximum amount possible, the amount of the mortgage gives the contract buyer a good estimate of the appraised value of the house. If the mortgage is for less than 60 percent of the purchase price he can assume that the house was overpriced and that his collateral is really not as valuable as it may appear to be.

The interest rate on the contract is of immediate importance to the contract buyer because it represents income to him. If the contract is the only instrument used in the sale of the house, with the holder of the vendor's interest also being the mortgagor, the interest rate on the contract and its relation to the rate on the mortgage is of additional importance. In this case the contract buyer will probably pay 5 percent on the mortgage and the vendee will pay 6 to 6½ percent on the same amount plus that rate on the net amount of the contract. Thus the buyer will collect one to one and a half percent "override" on the amount of the mortgage.

An example will serve to indicate (1) how some of the factors mentioned above influence the discount rate, (2) what that rate could be expected to be under the assumed conditions, (3) the magnitude of the return received by the contract buyer. Assume that a house sells for \$12,500. The vendor has obtained \$7,000 on it by giving a conventional mortgage which indicates that the appraised value is about \$11,666. The down payment on the contract is \$1,500 and the principal outstanding on the contract is \$11,000. The net amount of the contract, or the amount that the vendor has tied up in the contract, is \$4,000 (the selling price minus the sum of the mortgage and down payment). The interest rates are 5 percent on the mortgage and 6 percent on the contract. The principal on the contract (net) is to be paid off at the rate of \$40 per month for eight years with the balance due at the end of that time. The vendee makes one payment a month to the vendor (or contract buyer) who makes the payments on the mortgage. The rate of discount on a contract of this nature would usually be about 30 percent. We assume that the vendor rediscounts the contract at this rate immediately after the sale. (The discount is figured on the net amount of the contract or on the \$4,000 in this case.) He receives \$2,800 and the contract buyer assumes the mortgage. In order to make computations easier we will say that the mortgage runs for the same period of time as the contract. During the first month the contract buyer receives interest of 6 percent on \$11,000 or \$55. He has to pay 5 percent on \$7,000 or \$29.17. Therefore, the interest payment on the \$2,800 which he has invested in the contract is \$25.83 (\$55

minus \$29.17) or 12.5 percent. This is the rate of interest he will receive on the \$2,800 investment throughout the eight years. In addition, he will receive \$4,000 as principal on the contract although his outlay was only \$2,800. The additional \$1,200 is roughly equal to the total interest that would be received if 10.25 percent were charged on \$2,800 over a period of eight years, with the principal being reduced at the same rate as on the contract used in this illustration. (Of course, this \$1,200 will actually be received at a rate of \$12 per month until the end of the eight years when the remaining sum will be received.) Combining the interest payment and the returns arising from the \$1,200 discount, the rate of return on this buyer's investment is about 22.75 percent.

While discount rates are determined by an analysis of the factors presented here it is probable that these factors are most effective in determining the discount rate on one contract relative to that on another. Those interviewed stated that the real basis for setting a rate of discount was what the vendor was willing to accept.

Conclusions

The rediscount market for land contracts as found in the urban areas has little to offer vendors holding contracts on farm property, or farm people generally. The discounts are heavy and consequently, when rediscounting is prevalent, selling prices for contract financed purchases tend to be raised considerably above the prices of property financed by other means. Studies carried out at the University of Minnesota show that selling prices of farm property that is transferred by use of land contracts are not above prices on transfers involving other types of financing. The advantages to be obtained by a readily available rediscount market for rural contracts would not be expected to offset the disadvantage experienced by low-equity farm buyers if 10 to 15 percent was added to the price of their farms in order to cover the "costs" of the market. Another "cost" of the rediscount market is the higher

interest paid by vendees with contracts on urban property. Rural contracts tend to bear the same rate of interest as do mortgages on farm land. While there appears to be no inherent requirement for higher interest rates in the presence of a rediscount market, the fact that contract buyers can get the "over ride" on urban contracts would motivate them to leave rural contracts alone unless they could realize the same advantage there.

The unusually high returns realized by buyers of urban land contracts are undoubtedly due in part to the absence of perfect knowledge on the part of the investing public. Another factor of importance is the high degree of risk involved in this particular type of investment. At least two aspects of land contract financing in rural areas help to explain why rural vendors are willing to bear this risk without seeking compensation from the vendees. First, the rural vendor is able to spread the tax on his capital gain over the life of the contract if he receives less than 30 percent of the purchase price in the year of the sale. This feature of land contract carries less weight with the urban vendor because he typically wants the proceeds of the sale to use as operating capital if he is a building contractor or for investment in another home if he is just a homeowner. For these reasons urban vendors do not leave their money in the contracts and thus they voluntarily forego the tax savings. Second, there is frequently a close personal relationship between the rural vendor and vendee. They may be relatives or friends with mutual trust. Neither of these aspects of rural land contract financing is likely to have any meaning for the buyer of the vendor's interest. He does not receive the tax advantage nor is there likely to be a personal relationship between him and the vendee. Although the rural vendor is willing to bear the additional risk without direct monetary compensation, the contract buyer would not be expected to do so.

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A Pure Theory of Urban Renewal: A Comment^{*}

THE possibility of applying competitive price theory to public policy-making holds a curious fascination for some economists. Their hope is to develop simple, objective rules for decision-making so that public officials will not be tempted to exercise discretion or indulge their social philosophies.

A recent example is that of Otto A. Davis in connection with urban renewal. In his article, "A Pure Theory of Urban Renewal," (this journal, May 1960) Mr. Davis proposes that a city's governing body should act as "a rational entrepreneur" in deciding on urban renewal projects. The city should undertake a project only if it is "profitable." Profitable projects are those for which the expected revenues, consisting of the sale price of reclaimed sites plus the present value of net additions in property tax receipts, exceed the costs of acquisitions, improvements, and interest charges. Any proposed project which cannot meet this test should be rejected.

Mr. Davis lays down several corollaries to his main proposition. One is that federal or state subsidies to localities for urban renewal should be abandoned. A city or town following his rule does not need a subsidy; indeed, subsidies result in a misallocation of resources. Second, local governments should be vested with the power of eminent domain by the state. Third, they should be authorized to borrow outside of existing debt limitations for the purpose of acquiring blighted land providing they abide by the "profit" criterion.

The advantage of following this simple formula, according to Mr. Davis, is that it results in the "correct" allocation of resources. Urban renewal should not, he maintains, be used to effect a redistribution of income.

It is true, as Mr. Davis points out, that local officials responsible for urban renewal programs do not have adequate criteria for determining what projects to undertake and on what scale. But it is doubtful that the profit criterion will serve as a practical guide. And one may question whether it is even conceptually sound. As a general proposition, resources should be allocated so as to

maximize a community's net social product or income. The social product includes private goods and services such as automobiles, houses and beauty treatments. It also includes public goods and services such as education, streets, and police protection. Public powers such as urban renewal should therefore be employed so as to maximize the net social product. This may but need not mean maximizing the total receipts from a particular source of public revenue such as the real property tax. Much less does it mean that the general objective is served only if the present value of the added tax receipts from a specific renewal project is sufficient to recoup the city's loss in buying a blighted site at one price and selling at a lower price.

To illustrate, suppose there is a university in the community which not only trains technicians but also conducts research and development work for many of the city's industrial plants. With the passage of time the area surrounding the institution deteriorates and the blight threatens to impair the efficiency of the university. Should the area be renewed? If the city officials are obedient to the Davis rule, they will not renew this district because institutional uses are traditionally tax-exempt, hence "unprofitable" renewal projects. But the resultant loss in investment opportunities, jobs, incomes and aggregate tax receipts in other parts of the locality may far outweigh the deficit on this institutional renewal project.¹

What this illustration suggests is that urban renewal programs, like other public programs, can effect external economies of scale in the locality. Conversely, the absence of such programs can permit external diseconomies to accumulate and retard the economic development of a community.

¹ It may be argued that the university is simply a laboratory for private industry. Thus it should be prepared to compete for land on the same basis as a private entrepreneur, passing on to its customers any additional costs of production including property taxes, necessary to maintain an environment in which it can operate efficiently. But a university also trains English teachers and future housewives and affords opportunities for basic research which are not immediately translatable into profits. Thus the marginal social benefits which stem from an institutional renewal project are not fully measured by the marginal private benefits, even if we grant the proposition that the private benefits are correctly determined by land values and real property taxes.

^{*} The views expressed in this article are those of the author and do not necessarily reflect those of the Committee for Economic Development with which he is associated.

The city has been described as "an unbelievably complex collection of productive agents used to create other goods and services."² We need a better understanding of how these productive agents are functionally linked together in our local economies. This subject has attracted the interest of a number of able economists in recent years. Their findings are likely to prove more helpful to local officials responsible for public

programs such as urban renewal than the single criterion advanced by Mr. Davis.

In the last analysis, however, such findings can only provide local officials with a better factual basis for making decisions. They cannot and should not be offered as a substitute for good judgment.

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² Louis Winnick, "The Economic Functions of the City Yesterday and Tomorrow," in *The Urban Problems*, Proceedings of the Academy of Political Science (May 1960).

Book Reviews



Of Land and Men. By Garnett Laidlaw Eskew.
Washington, D. C.: Urban Land Institute, 1959, pp. 206. \$5.00.

This is a story of a group of men (for the most part, leaders in the National Association of Real Estate Boards) and their efforts to carry out an idea conceived and promoted by Walter S. Schmidt of Cincinnati, Ohio. After a brief and general evolution of the growth of our large cities which tended to show growth upward in the center and outward from the periphery, the story gets into the main theme, namely urban blight and the need for efforts to cope with it.

As early as 1936 Mr. Schmidt's efforts prompted the formation of the National Real Estate Foundation for Practical Research and Education, predecessor of the present Urban Land Institute, an independent non-profit organization. Leaders in the real estate business as well as men in industry and finance agreed that much more factual information, based upon experience, was necessary to adequately meet the challenge of urban blight and decay. As the story unfolds it reveals Mr. Schmidt's early environment, his civic and cultural interests, and his success as a developer. Through it all runs his zeal and passion to set up a research organization to do something about urban blight.

In 1940 the Urban Land Institute was "incorporated as an independent agency for research and education in the field of real estate . . . to assist American cities in their problems of planning, replanning, construction, and reconstruction. It is concerned not only with means for assuring sound city growth but also with means for conserving values in our present business and residential areas and for opening the way toward sound reconstruction of those areas where decay is far advanced. The Urban Land Institute soon issued its first bulletin on *Decentralization—What Is It Doing To Our Cities?* As time went on, it issued many more instructive

bulletins based upon studies of some segments of urban life. Some other important studies were the downtown areas of some of our larger cities. Later on in the story some of the results of these studies are related.

The story takes up postwar planning and relates in detail efforts to help in arresting urban blight. As a result of these efforts, special councils were organized. In January 1944, The Community Builders' Council was organized principally through the efforts of J. C. Nichols of Kansas City, and Hugh Potter of Houston, Texas. The most experienced men in the field of community building exchanged their ideas and finally developed The Community Builders Handbook. The work of The Community Builders' Council was well received. It was therefore deemed desirable to have other specialized groups within the folds of the Urban Land Institute. Accordingly, there was formed a Central Business District Council which specialized in the problems of the downtown areas of our larger communities. The heading of this chapter is, "There Will Always Be a Downtown." This council appointed individuals who had much experience in downtown affairs to sit with the proper authorities in the various communities and give their opinion as to the best way to handle the problems in the downtown areas of their communities. These men gave their time gratis to accomplish the over-all objective of the Urban Land Institute.

Still another Council was formed for the study of industry in communities. It was patterned along the same lines as the other two councils and offered similar services. Men most skilled in industrial development gave freely of their time to the cities which needed that type of service. Some of the results of the work of the three councils of the Urban Land Institute are disclosed in *Of Land And Men*.

The praises of many men are sung in this treatise; first of all, Walter S. Schmidt—and next J. C. Nichols of Kansas City, the man who built the Country Club District of

Kansas City and who for 22 years was a member of the National Capital Park and Planning Commission in the District of Columbia. In addition to these men, many other real estate men's names are conspicuous in the treatise. For the most part, they were presidents of the Urban Land Institute and those who took part in the various panels pertaining to urban real estate.

The book is well written by Garnett Laidlaw Eskew, assisted by John R. MacDonald. While it is a book about an idea and efforts to accomplish it, it also gives a great deal of up-to-date information on urban real estate. Any one interested in the future of large American cities will be well rewarded by reading this book.

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The Techniques of Urban Economic Analysis.
Ralph W. Pfouts, Editor. West Trenton,
New Jersey: Chandler-Davis Publishing
Company, 1960, pp. 407. \$5.00.

Ralph Pfouts as editor has brought together twenty-one papers, fairly widely scattered among scholarly journals but dealing with essentially the same theme. However, the title chosen for the volume is misleadingly broad. That title implies much more coverage than the somewhat meagre ground actually presented. By and large, this book deals with the so-called theory of the economic base. Only four of the twenty-one papers are concerned principally with other possible approaches to the study of urban economies. Of these, one applies an aggregated Keynesian-type model to a community and the other three discuss the possibilities of application of more disaggregated input-output-type models to metropolitan areas.

One would expect in a volume entitled *The Techniques of Urban Economic Analysis* to find at least one article dealing with gravity and potential models. Further, the work by Benjamin Stevens on the applicability of linear programming to the study of metropolitan areas would seem to be well qualified for inclusion in such a book. The same

applies to some of the papers by William Garrison and his associates. Some contributions by members of the research groups who studied the economic problems of the New York and Chicago areas would have been valuable but it may be that the editor had to make his final decisions at such an early date that only little of the above-mentioned material was available.

Given the narrow range of the present volume, there can be no doubt that Dr. Pfouts has made a highly respectable selection of papers. If one might venture a critical remark it would be that Pfouts should have gone a little farther in his search for contributions; some of Fred Forbat's writings are available in German and might have been translated for the purpose; a summary might also have been given of Barfod's truly pioneering study, *Local Economic Effects of a Large-scale Industrial Undertaking* published in London in 1938.

The core of the book consists of nine of the articles written by Richard Andrews and published in *Land Economics* a few years ago. Since these articles originally appeared over a period of four years, they contain several repetitions which make the reading a little hard going at times but it is certainly worthwhile to read these papers. There exists nowhere else in the literature such a thorough and well-balanced presentation and examination of the theory of the economic base.

Pfouts has also included several papers which launch rather severe attacks against the theory of the economic base. Among them are papers by Gillies and Grigsby, Hans Blumenfeld, Charles Tiebout, Charles Ferguson and Ralph Pfouts. The most ardent and far-reaching criticism is delivered by Blumenfeld; the most understanding criticism is given by Charles Tiebout. The paper by Pfouts contains a statistical test which supposedly "rejects" the theory of the economic base but the validity of this test seems doubtful. In other words, it is quite unclear to what extent this test really measures what it is supposed to measure.

However, when all is said and done, the reader is left with a strong impression that, as regards future research, the theory of the economic base is a dead-end street.

The four final papers open up other vistas. Charles Tiebout applies a simple Keynesian

model to a small suburban community, and arrives at some interesting results. The three remaining articles, of which the one by Isard and Kavesch is the most important, deal with the input-output approach. These three papers present some general characteristics and shortcomings of input-output systems, including an interregional system. However, one finds very little discussion of the specific problems of theory and implementation that has to be faced in any empirical application of input-output to a metropolitan area. A rather crucial question of research strategy,

namely whether it is worthwhile to undertake an input-output study in face of the very high costs involved, is barely touched on.

The volume contains some misprints. The most important are (1) on p. 293, where the two columns of figures have been reversed; (2) on p. 349, where the "plus" signs have been omitted in the formulae at the bottom of the page.

ROLAND ARTLE

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Availability of Recently Published Articles

A very limited supply of the following articles which have appeared in *LAND ECONOMICS* is now available. Write to Office of the Editor, 3310 Sterling Hall, University of Wisconsin, Madison 6, Wisconsin. Send fifty cents in stamps or check for each article.

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- Regional Planning Legislation in Underdeveloped areas. *By Charles Abrams*

Index to

LAND ECONOMICS

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PLANNING, HOUSING & PUBLIC UTILITIES

VOLUME XXXVI

February 1960-November 1960

LEADING ARTICLES

- | | |
|---|---|
| <p>ASHLEY, JOHN W. A Suggestion for Improving Public Utility Regulation.....158-163</p> <p>BALLAINE, WESLEY C. Taxes and the Conservation of Privately-Owned Timber.....279-285</p> <p>BELOTTI, LORENZO MARIO. An Analysis of the Italian Agrarian Reform.....118-128</p> <p>BIRKHEAD, GUTHRIE S. Toward a Water Resource Development Program for Eastern Rivers (Jesse Birkhead, co-author).....142-157</p> <p>BUNKE, HARVEY C. The Status of Rate-Making.....129-141</p> <p>BURKHEAD, JESSE. Toward a Water Resource Development Program for Eastern Rivers (Guthrie S. Birkhead, co-author).....142-157</p> <p>CAMPBELL, THOMAS C. Agricultural Exemptions from Motor Carrier Regulation.....14-25</p> <p>DENMAN, D. R. The Future Ownership of Rural Land in Britain.....52-64</p> <p>FARMER, RICHARD N. Inland Transportation Entry and Rate Controls in the Arab Middle East.....35-42</p> <p>FEDER, ERNEST. Feudalism and Agricultural Development: The Role of Controlled Credit in Chile's Agriculture.....92-108</p> <p>GREENHUT, MELVIN L. Recent Industrial Development of Underdeveloped Areas in the United States.....371-379</p> <p>HOYT, HOMER. Changing Patterns of Land Values.....109-117</p> <p>JOHNSON, WEBSTER V. Agriculture in the Economic Development of Iran.....313-321</p> <p>KEYES, LUCILE SHEPPARD. Welfare Economics and the Theory of Regulation.....349-361</p> <p>KRISTJANSON, BALDUR H. The Agrarian-Based</p> | <p>Development of Iran.....1-13</p> <p>KURNOW, ERNEST. Land Value Trends in the United States.....341-348</p> <p>LOWRY, IRA S. Filtering and Housing Standards: A Conceptual Analysis.....362-370</p> <p>MADDOX, JAMES G. Economic Growth and Revolution in Mexico.....266-278</p> <p>MALLAKH, RAGAEI EL. Economic Integration in the United Arab Republic: A Study in Resources Development.....252-265</p> <p>MARCUS, EDWARD. Agriculture and the Development of Tropical Africa.....172-180</p> <p>MAXWELL, W. DAVID. The Regulation of Motor-Carrier Rates by the Interstate Commerce Commission.....79-91</p> <p>MINGHI, JULIAN V. The Problem of the Conservation of Salmon with Special Reference to Bristol Bay, Alaska.....380-386</p> <p>PHILLIPS, CHARLES F., JR. The Competitive Potential of Synthetic Rubber.....322-332</p> <p>SARGENT, FREDERIC O. Criteria for Appraisal of Planning Water Resource Development Agencies in Texas.....43-51</p> <p>SMITH, STEPHEN C. Resource Policies and the Changing West.....26-34</p> <p>SPORN, ARTHUR D. Empirical Studies in the Economics of Slum Ownership.....333-340</p> <p>THOMAS, MORGAN D. Economic Activity in Small Areas.....164-171</p> <p>WEAVER, ROBERT C. Class, Race and Urban Renewal.....235-251</p> |
|---|---|

REPORTS AND COMMENTS

- | | |
|--|--|
| <p>CLARENBACH, FRED A. Ceylon's Ten-Year Plan and Prospects.....188-194</p> <p>CROSSON, PIERRE R. Further Comment on Economic Base Theory.....197-201</p> <p>DANIEL III, COLDWELL. The Volume of Nonfarm Residential Construction: An Analytical Framework.....202-207</p> <p>DAVIS, OTTO A. A Pure Theory of Urban Renewal.....220-226</p> <p>DOWNS, ANTHONY. An Economic Analysis of Property Values and Race (Laurenti).....181-188</p> | <p>ELEFSON, VERN R. The Rediscount Market for Land Contracts.....391-394</p> <p>HEILBRUN, JAMES. Urban Economics: Some Lessons from Gertrude Stein.....291-296</p> <p>KUNKEL, JOHN HOWARD. The Role of Services in the Annexation of a Metropolitan Fringe Area.....208-212</p> <p>LEE, JAMES E. Zoning and the Paradise Lost.....297-302</p> <p>RICHARDSON, NIGEL H. Some Factors Affecting Urban Development: A Case Study.....194-197</p> |
|--|--|

- RYAN, FREDERICK L. Economic Growth: The San Diego Case.....286-291
- SAMPSON, ROY J. Another View of Comparative Regional Development.....216-220
- SCHENKER, ERIC. Public Investment in Navigation Projects: A Case Study.....212-216
- SCHUSSEIM, MORTON J. A Pure Theory of Urban Renewal: A Comment.....395-396
- WILSON, GEORGE W. The Nature of Competition in the Motor Transport Industry.....387-391

BOOK REVIEWS

- BROWN, ROBERT. *Public Housing in Action: The Record of Pittsburgh*.....229
- DE CHAZEAU, MELVIN G. and KAHN, ALFRED E. *Integration and Competition in the Petroleum Industry*.....304
- DENMAN, D. E. and STEWART, V. F. *Farm Rents: A Comparison of Current and Past Farm Rents in England and Wales*.....305
- DORE, R. P. *Land Reform in Japan*.....309-310
- EKEW, LAIDLAW, G. *Of Land and Men*.....397
- GLAESER, MARTIN. *Public Utilities in American Capitalism*.....227-228
- HAAR, CHARLES M. *Land Use Planning*.....303
- HALL, MAX, Editor. *Made in New York*.....303
- HANDLIN, OSCAR. *The Newcomers: Negroes and Puerto Ricans in Changing Metropolis*.....308
- HOOVER, EDGAR M. and VERNON, RAYMOND. *Anatomy of a Metropolis*.....303
- NELSON, RICHARD L. *The Selection of Retail Locations*.....307
- PFOUTS, R., Ed. *The Techniques of Urban Economic Analysis*.....398
- SCOTT, MEL. *The San Francisco Bay Area*.....311-312
- SHOUP, CARL, et al. *The Fiscal System of Venezuela*.....230
- SHULTZ, EARLE. and SIMMONS, WALTER. *Offices in the Sky*.....307
- VOSE, CLEMENT. *Caucasians Only*.....231
- WARD, J. T. *Farm Rents and Tenures*.....305
- WIBBERLEY, G. P. *Agriculture and Urban Growth: A Study of the Competition for Rural Land*.....306

SUBJECT MATTER

A

- Africa**
- agriculture and economic development in tropical area
- low elasticities of demands.....172
- primitive methods.....176
- soils conditions.....175
- tenancy problems.....177
- tribal traditions.....178
- see also United Arab Republic
- Agrarian-based development of Iran**
- aims of current (1960) development plan.....313-314
- allotment of economic farm units.....11
- capital formation and productivity.....4
- distributions of crown and public domain lands.....4-9
- farm forage crops.....319
- investments in agriculture versus other purposes.....314-315
- land resource inventory.....317-319
- need for credit policy.....10
- tenure pattern.....3-4
- Agrarian reform**
- see Africa; Arab Middle East; Ceylon; Chile; Iraq; Italy; Mexico; United Arab Republic
- Agriculture**
- see Agrarian reform; Economic development; Farm credit controls; Land contracts; Land Utilizations; Natural resources; Rural land ownership in Britain
- Alaska**
- conservation of salmon in Bristol Bay
- biological complications.....381
- economic complications.....383
- jurisdictional conflicts with Japan.....380-381
- Annexation**
- role of services in metropolitan fringe area.....208-212
- see also Economic growth; Slums
- Appraisal land**
- see Annexation; Economic growth; Economic base

theory; Urban land; Slums; Land values; Housing standards

Arab Middle East

- inland transportation controls
- entry controls.....35
- ownership of transport facilities.....36
- price controls.....39
- see also Africa; United Arab Republic

C

- California Public Utilities Commission study of operation procedures.....158-163
- see also Welfare economics

Ceylon

- ten-year plan for economic development.....188-194

Chile

- controlled credit in agriculture
- centralization of operation.....98
- credit in short supply.....96, 97
- distribution among borrowers.....100
- development loans plan.....99
- legal framework.....94
- net worth and loan grants.....102
- under-evaluation of farm real estate.....100

City planning

- analytical framework, nonfarm residential construction.....202-203
- annexations, role of services in fringe areas.....208-212
- economics activity in small areas.....165-170
- economics base theory.....197-201, 292-294, 296
- health resort versus industrial center: case study.....286-289
- property values, impact of race on sales price.....181-185
- zoning, need for substitute procedure.....297-302
- see also, Housing standards; Land values; Slums; Urban land; Urban renewal
- Competition in motor transport industry.....387-391
- see also Motor carrier regulation

2-216	Conservation	
5-396	<i>see</i> Timber land; Wisconsin; Alaska	
	E	
7-391	Eastern rivers	
	a water resource development program	
	citizens associations.....	146
	federally-created basin agency.....	155
	government programs and officials.....	144
	hydroelectrical power.....	149
	industrial and municipal water.....	147
.303	institutional setting.....	143
	interstate compact.....	153
	private enterprise.....	145
.307	<i>see also</i> Navigation projects; Water resources development	
.398	Economic activity in small areas	
.312	analysis of changes in levels and structure	
230	basic-nonbasic concept.....	168
	coefficient of regional specialization.....	167
.307	concepts and techniques.....	167
231	factors which effect change.....	165
305	input-output model.....	170
	<i>see also</i> Annexation; Economy base theory	
306	Economic base theory	
	comment on theory as limiting policy.....	197-201
	foreign trade implications of basic-nonbasic theory.....	294
	planning aims examined.....	296
	testing the basic-nonbasic theory.....	290-292
	<i>see also</i> Annexation; Economic growth; Urban renewal and racial balance	
	Economic development	
	<i>see</i> Africa; Agrarian-based development of Iran; Alaska; Arab Middle East; Ceylon; Eastern rivers; Economic growth; Mexico; Rubber; United Arab Republic	
.35	Economic growth	
.36	social costs versus rapid industrial expansion: case study, San Diego	
.39	effect of invasion of giant electronics corporation 286-285	
	General Dynamics.....	288
	San Diego formerly a paternalistically controlled city.....	285
63	Spreckels interests.....	286
	<i>see also</i> Land values	
94	Egypt	
	<i>see</i> Arab Middle East; United Arab Republic	
	F	
98	Farm credit controls	
97	<i>see</i> Chile; Iran; and contracts	
00	Forestry	
99	<i>see</i> Timber land; Wisconsin	
94		
02	G	
00	Great Britain	
	future ownership of rural land	
03	change in social ideas.....	55
2	effect of death duty.....	58
0	Farm Rent Survey: 1956-1958.....	59
6	flexible tenancy and rising rents.....	59
9	land nationalization.....	62
5	owner-occupation economy.....	61
2	small estates and institutional ownership.....	57
	stability in economic affairs.....	54
	H	
1	Housing standards	
	filtering: a conceptual analysis critique.....	362-370

	I	
	Industrial development	
	regional and inter-regional railway distribution patterns.....	212-220
	<i>see also</i> Economic growth; Land values; Mexico; Regional development; Rubber; Under-developed areas, United States	
	Industrial location	
	<i>see</i> Annexation; Economic base theory; Economic growth; Rubber; Under-developed areas, United States; Urban land	
	Interstate Commerce Commission	
	<i>see</i> Competition in motor transport industry; Industrial development; Motor carrier rates regulation analysis; Regulation of railroad rates; Welfare economics	
	Iran	
	<i>see</i> Agrarian-based development of Iran	
	Iraq	
	<i>see</i> Arab Middle East	
	Irrigation districts	
	<i>see</i> Eastern rivers; Natural resources; Water resource development	
	Italy	
	analysis of agrarian reform	
	area subject to reform by zones.....	121
	distribution of expropriated lands.....	122
	progress report.....	124-128
	provisions of reform law, 1950.....	119
	J	
	Jordan	
	<i>see</i> Arab Middle East	
	L	
	Land contracts	
	rediscount market in farm lands.....	391-394
	Land ownership	
	<i>see</i> Africa; Ceylon; Great Britain; Land values; Slums; Timber land	
	Land utilization	
	<i>see</i> Africa; Agrarian reform; Ceylon; Eastern rivers; Economic base theory; Economic growth; Land values; United Arab Republic; Urban development; Urban land	
	Land values	
	trends in the United States	
	Census of Governments, 1957.....	341
	concentration on land values.....	347
	land-to-real-property ratio.....	343
	regions and states.....	345
	Lebanon	
	<i>see</i> Arab Middle East	
	M	
	Mexico	
	economic growth and revolution	
	changes in entrepreneurship.....	271
	gross national product growth.....	266-268
	highlights of the revolution.....	268
	Motor-carrier rates regulation analysis	
	philosophy of Interstate Commerce Commission	
	administration of restrictions.....	81
	analysis of cases approved.....	82
	analysis of cases disapproved.....	84
	complaints against existing rates.....	88

- suspended rate increases.....87
 statutory provisions on rate-making.....80
 types and disposition of cases.....81
see also Motor-carrier regulation; Welfare economics
- Motor carrier regulation**
 agricultural exemptions
 Act of 1935.....14-18
 Agricultural Marketing Act of 1946.....19
 impact on traffic movement.....22
 interpretations on exemptions.....18-23
 Interstate Commerce Commission.....17
see also Motor-carrier rates regulation analysis;
 Welfare economics
- Motor transport industry**
 nature of competition.....387-391
see also Motor carrier regulation
- N**
- Natural resources**
 public policy in western United States
 interest compacts.....27
 irrigation districts.....32
 large-scale water development.....33
 new technology.....28
 recreation lands problems.....28-31
see also Alaska; Eastern rivers; Forestry; Rubber;
 Water resource development; Wisconsin
- Navigation projects**
 influence of larger tankers on public interest
 petroleum industry and U. S. Engineers Corps.212-216
see also Water resources development
- Nonfarm residential construction volume**
 analytical framework
 conceptual scheme.....203
 single-family versus multi-family housing.....202
see also Annexation; Urban land
- P**
- Property values**
 impact of race upon sales prices.....181
see also Annexation; Economic base theory; Economic growth; Land values; Slums; Urban renewal and racial balance
- Property Values and Race (Luigi Laurenti)**
 an economic analysis and critique
 description of methodology of study.....181
 effects of a general housing surplus.....185
 ratio of test-area prices to control-area prices.....182
see also Urban renewal and racial balance
- Public housing**
see Housing standards; Land values; Property values; Slums; Urban renewal and racial balance
- Public utilities**
see Motor carrier regulation; Public utility commissions; Regulation of railroad rates; Welfare economics
- Public utility commissions**
 suggested improvement in procedures: case study
 analysis of nine decisions, California.....160
 costs of two pipelines at various pressures.....161
see also Welfare economics
- R**
- Railroads**
see Regulation of railroad rates; Welfare economics
- Real estate**
see Annexation; Economic growth; Housing standards; Land values; Slums; Urban renewal and racial balance
- Recreation lands**
see Eastern rivers; Economic growth; Natural resources; Texas
- Regional development**
see Africa; Economic activity in small areas; Economic development; Industrial location; Rubber; United Arab Republic; Urban development; Urban land
- Regulation of railroad rates**
 analysis of status of rate-making
 cost structures and pricing policies.....133
 historical trend since 1850.....130-132
 Interstate Commerce Commission.....132, 141, 216
 minimum regulation in the abstract.....135
 Transportation Act of 1958.....138
 transportation in Mid-Twentieth Century.....131
see also Industrial location; Motor transport industry; Regional development; Welfare economics
- Residential construction**
 analytical framework for nonfarm volume.....202-217
see also Annexation; Economic growth; Land values; Slums; Urban land
- Rubber**
 competitive potential of synthetics
 domestic capacity, 1959.....322-324
 national security: foreign policy.....331
 natural rubber industry status.....328
 plants in operation outside United States.....325-326
 technological innovations.....326
- Rural land ownership in Britain (future).....52-64**
- S**
- San Diego, California**
 health resort versus industrial center.....286-289
- Saudi Arabia**
see Arab Middle East
- Slums**
 empirical studies in economics of ownership: case study
 correlation between depreciation and turnover rates.335
 depreciation rates.....335
 ownership turnover.....334-335
 public acquisition of property.....336
 return on capital investment.....336
- Syria**
see Arab Middle East; United Arab Republic
- T**
- Taxation**
see Land values; Property values; Slums; Timber land; Welfare economics
- Tenancy**
see Africa; Ceylon; Economic growth; Great Britain; Mexico; Urban renewal and racial balance
- Texas**
 water resource development agencies
 Brazos River watershed.....44
 criteria for appraisal.....43
 federal agency control.....48
 key position of state engineers' board.....45
 small-watershed program.....47
 state parks board relation.....46

- super-planning agency proposal..... 49
- see also* Eastern rivers; Natural resources
- Timber land
 - taxes and conservation of privately-owned timber
 - effect of taxes on management.....280
 - meaning of conservation..... 279
 - types of taxes effecting conservation..... 282
- Transportation
 - see* Arab Middle East; Industrial development; Motor carrier regulation; Regulation of railroad rates; Urban land; Welfare economics
- Transportation Act of 1958.....138

U

- Under-developed areas, United States
 - industrial development growth
 - national market effect.....372
 - sectional market effect.....373
 - southern (regional) development.....372
- Under-developed economics
 - see* Africa; Arab Middle East; Ceylon; Mexico; United Arab Republic
- United Arab Republic
 - economic integration: a study in resources development
 - competitive aspects of merger..... 254
 - expenditure estimates, ten-year plan: Syria..... 263
 - five-year plan for industrialization: Egypt..... 262
 - problematic aspects of union..... 259
 - see also* Arab Middle East
- Urban development
 - case study (fringe area of Montreal in postwar period).....194-197
 - see also* Annexation; Economic base theory; Economic growth; Land values; Slums; Urban renewal and racial balance
- Urban economics
 - see* Economic base theory; Economic growth; Land values; Slums; Urban land
- Urban land
 - changing patterns in United States: land values vs. use

- Central Business Districts.....115
- nucleation of complementary uses.....116
- population and acreage shifts.....115
- shifts in railroad towns.....111
- shifts in river towns.....110
- significant effect of automobile.....112
- see also* Economic base theory; Economic growth; Land values; Slums; Urban development; Urban renewal and racial balance
- Urban renewal
 - pure theory approach..... 220-226, 395-396
 - see also* Economic growth; Land values; Slums; Urban renewal and racial balance
- Urban renewal and racial balance
 - class-and-race mix.....250-251
 - impact of newcomers on housing market..... 236-240
 - middle-class families in central city..... 240-243
 - role of good schools.....247-250
 - see also* Slums; Urban renewal

W

- Water resources development
 - Eastern rivers; Texas
- Welfare economics
 - theory of regulation
 - "economic" viewpoint.....350
 - methods of evaluating decisions.....352
 - necessary legal limits.....358
 - price-equals-marginal-cost rule.....359
- Wisconsin
 - forest crop law under general property tax
 - average tax revenue per acre.....72
 - determination of tax ratios.....66
 - influence of four major factors.....76
 - nine forest-type and timber-size classes.....67
 - tax ratios comparisons.....70-71
 - Wisconsin Forest Crop Law.....65-78

Z

- Zoning
 - need for a substitute procedure.....297-302

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